

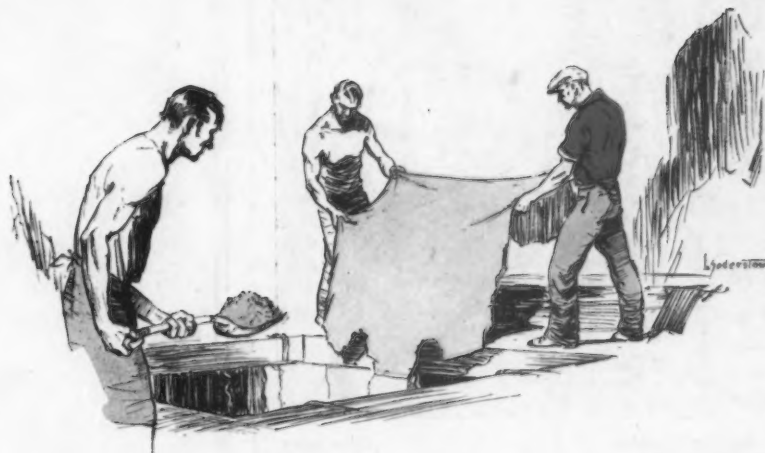
MAY 6 1927

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MAY 6 1927

THE IRON AGE

MAY 5, 1927



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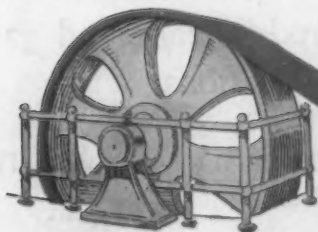
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*Coke Screening Station of Consolidated Gas Company
at Hunt's Point, New York*

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A Koppers Material Handling System serves the Becker type gas oven plant of the Consolidated Gas Company at Hunt's Point, New York. This system prepares and delivers 1750 tons of coal per day to the ovens, and handles, sizes and screens approximately 1200 tons of coke. The screening station, an important unit in the system, separates the domestic coke into four sizes and cleans it from breeze.

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THE IRON AGE

New York, May 5, 1927

ESTABLISHED 1855

VOL. 119, No. 18

Electrochemistry After 25 Years

Progress in the Industry Reviewed by Charter and
Other Members—First Symposium Ever Held
on Direct Ore Reduction Processes



CELEBRATING the twenty-fifth anniversary of its birth in the city where it originated, the American Electrochemical Society last week, April 28 to 30, distinguished itself in at least two important respects: It made notable contributions to the literature of the gaseous reduction of ores, and staged a review of the remarkable achievements in electrochemistry in the last quarter century. The prestige of the society, already large, was accordingly advanced to new heights. Recognition should also be accorded an excellent symposium on the electrochemistry of concentrated solutions.

For the silver jubilee session, special contributions of an historical nature were made by specialists in various fields and the presence of several charter members of the society added unusual interest.

The symposium on direct processes for the reduction of iron and other ores, the first of its kind, was one of the most, if not the most, valuable one ever organized by the society, which is noted for its crystallizing, technical information through the medium of symposiums.

The attendance for the three days reached 300 members and guests, fully equal to some of the largest meetings ever held. So many were the subjects of broad scientific and industrial import, treated in the 63 papers scheduled for the four sessions, that only part of these can well be reviewed in the following account.

Silver Anniversary Impressively Celebrated

FORMAL recognition of the birth of the society was concentrated in a special session on Friday evening, April 29. Colorful in its surroundings and favored with unusual weather, it consisted of a jubilee dinner at the Old Mohican Club House at Morris-on-the-Delaware, on the east side of the Delaware River, a few miles north of Camden, N. J. Late in the afternoon of April 29, over 150 persons, including nine of the charter members, were transported in buses from the Benjamin Franklin Hotel, shown above, the headquarters in Philadelphia, to this interesting place. The company viewed the preparation of a plank shad dinner in its old-fashioned surroundings around a fire in the yard and had its photograph taken.

The affair resolved itself virtually into a banquet. Some 23 papers had been prepared for this anniversary session—papers largely historical, reviewing the progress of electrochemistry since the founding of the society. This formidable program was abandoned and, in its place, a few appropriate addresses were made by three of the founders present.

Reminiscences by Charter Members

Dr. Edgar F. Smith, professor of chemistry, University of Pennsylvania, Philadelphia, and one of the six honorary members of the society, was introduced by the retiring president, Dr. William Blum, United States Bureau of Standards, Washington, as the chairman, or really toastmaster, for the evening.

Referring to himself as one of the "recalcitrants" or "scamps" who refused in 1902 to recognize the feasibility of organizing an American electrochemical society, Doctor Smith paid a tribute to the society and its work and to the fact that history had justified the step then taken. When he had been notified that the anniversary convention was to be held in the Benjamin Franklin Hotel at Ninth and Chestnut Streets, Philadelphia, he at once recalled the appropriateness of the location.

Back in 1819, diagonally across the street where now stands the United States Post Office, there was once a building belonging to the University of Pennsylvania, where Robert Hare, professor of chemistry at that time, did some remarkable work. In those early years Professor Hare, on that spot, developed the electrical dissociation of calcium chloride in the presence of mercury, forming the Ca-Hg compound. He also produced in a small electric furnace calcium carbide which, thrown on water, produced acetylene, and it was he also who was successful in producing graphite electrically.

These were pointed to by Doctor Smith as the foundations of present-day large commercial electrochemical industries. Professor Hare also introduced the mercury cathode, with Gibbs as his pupil in 1843, who in 1883 announced a new way of determining metals electrically—a process which today is the basis of the electrolytic refining industry. In 1874 Doctor Smith himself separated cadmium from zinc electro-



Nine of the Charter Members Who Were Present: Left to right—Carl Hambuechen, Ajax Metal Co., Philadelphia; Prof. Louis Kahlenberg, University of Wisconsin, Madison, and general manager Dow Chemical Co., Midland, Mich., producer of magnesium; Co., New York; Lawrence Addicks, consulting engineer, New York; Samuel S. Sadtler, Electric Smelting & Aluminum

lytically and produced cadmium by the electrolytic current, he said.

Doctor Bancroft and Theory

The first charter member called on by Doctor Smith was Dr. Wilder D. Bancroft, professor of physical chemistry Cornell University, Ithaca, N. Y. Introducing him as the author of many notable contributions to electro- and physical chemistry, he paid a special tribute to his work as the founder and editor of the *Journal of Physical Chemistry*, an achievement alone worth distinguished recognition. In a humorous vein Professor Bancroft reviewed some of the incidents of the formation of the society, his most serious offering being one of the 23 papers referred to and entitled "Twenty-five Years of Theoretical Electrochemistry."

Professor Kahlenberg and Facts

As the second of the three founders, Doctor Smith called on Prof. Louis Kahlenberg, professor of chemistry, University of Wisconsin, Madison, Wis. Referred to as the man who always insists on facts as contrasted with the more theoretical tendency of the previous speaker, Professor Kahlenberg, also in a humorous vein, indulged in reminiscences. Seriously, however, he paid a tribute to three other early pioneers in the society's history—E. F. Roeber, Joseph W. Richards and Carl Hering—now passed away, whose spirits he felt were present at this reunion. He cited the fact that the Faraday Society in England is an-

alogous to the American Electrochemical Society, and that Germany has its German Electrochemical Society. In the early days electricity, he said, was pointed to as not a "thing" but an energy. Now it is regarded as really a "thing" and hence "we are the society." Professor Kahlenberg also is the author of one of the papers referred to, "A Retrospect and a Look Into the Future."

Lawrence Addicks, Theory and Practice

The third charter member called upon by Doctor Smith was Lawrence Addicks, consulting engineer, New York, who, after several humorous allusions, developed the theme that both theory and practice are needed and each needs the other.

Some of the Review Papers

IN THE IRON AGE of April 21, page 1163, there was published a detailed program of papers for both the jubilee session and the symposium on gaseous reduction. As already indicated, the jubilee program, to which some late additions were made, was presented only by title.

Electric Furnaces at Niagara Falls

Besides the two papers by charter members of the society, already referred to, there were several others which dealt with the history of the various phases of the industry in the past 25 years. Among these may

How the Society Came Into Being

REALIZING that electrochemistry was rapidly assuming large scientific and industrial importance, six men, in October, 1901, proposed by letter to thirty-four other scientists and engineers the formation of a national electrochemical society. The six men were Carl Hering, C. J. Reed, J. W. Richards, E. F. Roeber, Prof. Samuel P. Sadtler and Dr. William H. Wahl.

On Friday evening, Nov. 1, 1901, those who were sympathetic toward such a movement met at the Engineers Club, Philadelphia. The result was the organization of a new society which held its inaugural convention at Philadelphia, April 3, 1902. It was the conviction of those pioneers that the American Chemical Society, then over twenty-five years old, was not organized to serve such an industry as electrochemistry. It did not have organized divisions then as now, and there was an "educational qualification for membership which kept out many electrical engineers and others interested in electrochemistry, though not primarily from the chemical end." Efforts to cooperate failed and the American Electrochemical Society came into being.

The first president was Prof. J. W. Richards, Lehigh University, Bethlehem, Pa., who later, as secretary of the society for many years, passed away five years ago. C. J. Reed was the first secretary and Pedro G. Salom, of storage battery fame, was treasurer.

Founded by an enthusiastic group of men "highly imbued with the idea of the service which electrochemistry, properly developed, could render to mankind," the society started with 272 members, which has expanded now to over 1700. It numbers, and has had on its roll, many distinguished theoretical and practical scientists and industrialists, and its sessions rank today among the best in technical value in the brilliant roster of American associations of a scientific nature.



St. Louis, treasurer Benwood-Linze Co.; G. H. Clamer, president and general manager Wis.; Prof. Wilder D. Bancroft, Cornell University, Ithaca, N. Y.; H. H. Dow, president Dr. F. M. Becket, vice-president Union Carbide & Carbon Co., and Electro Metallurgical president Samuel P. Sadtler & Son, Inc., Philadelphia, and Alfred H. Cowles, president Co., Sewaren, N. J.

be mentioned one entitled "The Use of Electric Furnaces at Niagara Falls, 1902 to 1926," by F. A. J. Fitzgerald, Fitzgerald Laboratories, Niagara Falls, N. Y. The paper presents figures showing the remarkable growth of furnaces used in certain electrothermic processes in Niagara Falls during the existence of the American Electrochemical Society.

Electric Steel During 25 Years

In the field of electric steel there were two papers, one entitled "Electric Steel in United States 'Attains Its Majority,'" by Dr. John A. Mathews, vice-president and metallurgist Crucible Steel Co. of America, New York, and the other entitled "American Electric Steel Expansion in the Last Twenty-five Years," by Edwin F. Cone, associate editor THE IRON AGE, New York.

The paper by Doctor Mathews deals with some of the metallurgical and other developments in the industry. Electric steel was not produced commercially in the United States until about four years after the founding of the society, one of the handicaps being the difficulty of procuring carbon electrodes of sufficient size and mechanical strength. During the author's experience, the electrode cost per ton of steel has dropped from \$8 to less than 50 cents. The first American "all electric" steel from ore to finished product was poured in 1909, and one of the chief factors that has furthered the electric steel industry is the central station's lowering of wholesale power rates. "Electric steels are produced today superior in quality to any

fuel-fired furnace product. This new standard of quality is of great importance and value to the automotive industry."

The paper by Mr. Cone is a brief statistical review of the progress of the industry since its beginning, showing the approximate number of furnaces which have been installed year by year and the electric output of the country from 1909 to 1925. From only about six furnaces in 1910, the number has expanded to over 500 at the present time in this country, with the production attaining over 615,500 tons in 1925 from a beginning of only 13,600 tons in 1909. Reference was made to the large tonnages of cast iron and gray iron, particularly alloy, made in electric furnaces, and a tribute is paid to the society for the role it has played in developing knowledge on this subject.

Rapid Progress in Electric Non-Ferrous Melting

A valuable contribution to the developments in the use of the electric furnace in the non-ferrous industry is contained in a paper entitled, "Twenty-five Years of Non-Ferrous Electrothermics; Fifteen Years of Electric Brass Melting," by Dr. H. W. Gillett, chief division of metallurgy Bureau of Standards, Washington. The author asserts that the proportion of electrically melted metal is much greater in the brass industry than in the steel industry and that electric brass melting is now practically standardized upon three specific types of furnaces. Of all the thousand individual electric brass furnaces that have been built

Three Founders of the Society Who Have Passed Away



E. F. ROEBER



J. W. RICHARDS



CARL HERING

in America, both for domestic and export trade, more than 80 per cent have been of these three types. About 675,000 tons of brass, bronze and nickel silver were electrically melted in 1926, requiring 180,000,000 kwhr. The paper contains much other valuable information in this important field.

Progress in Aluminum Reviewed

Two papers were devoted to aluminum, one entitled "The Discovery of Aluminum," by Martin Tosterud, and Junius D. Edwards, Aluminum Co. of America, New Kensington, Pa., and the other entitled "Aluminum from Oersted to Arvida," also by Mr. Edwards. A somewhat elaborate, written discussion of the latter paper was in printed form as offered by Alfred H. Cowles, Sewaren, N. J., now generally recognized as the originator of the electric reduction of aluminum. Mr. Cowles was one of the founders of the society and was present during the convention.

There were several papers on electrolytic refining of some of the major metals. One contribution on

this subject was written by Lawrence Addicks, entitled "Electrolytic Refining During the Past Twenty-five Years," and some of the others were "Twenty-five Years Progress in the Electrolytic Refining of Copper," by S. Skowronski, research chemist Raritan Copper Works, Perth Amboy, N. J.

While much progress has been made in practice, considerably greater progress has been made in the theory of electrolytic refining, said Mr. Addicks, a recognized authority in this field. Twenty-five years ago copper was practically the only metal electrolytically refined on a large commercial scale. Today lead, zinc, gold and silver are refined by very similar processes. Mr. Skowronski in his paper stated that the annual production of electrolytic copper in this country has increased to five times that of 1902, and that the capacity of the American copper refineries today is about 1,500,000 tons. Some of the metallurgical details which have developed in recent years in perfecting the refining of copper are dealt with in the paper.

Metals Reduced from Oxides by Direct Processes

UNIQUE in its originality and in the variety of topics presented, the symposium on the "Gaseous Reduction of Ores and Other Metal Compounds," the first one ever held, exceeded the expectations of its promoters in its success and in the interest that it excited. The scheduled program of 19 papers was so long that part of it had to be pushed over from Thursday to Saturday for presentation.

Special credit is due to Frank Hodson, consulting metallurgist, Philadelphia, and chairman of the local committee in charge of the convention, for his part in organizing this program, particularly the section relating to iron ores. Mention should also be made here of the splendid work of the local committee for the arrangements of the convention as a whole.

The symposium included direct reduction of oxides of iron, tin, zinc, molybdenum, tungsten and copper. A feature was the international character of the program, some papers coming from England, Canada, Japan, Sweden and Germany.

Metallic Iron Obtained by Gaseous Reduction

BY far the most interesting and important section of the symposium was that devoted to iron ores—or the direct process for making steel or metallic iron. Six papers were presented and discussed before an attentive assemblage of over 200. Space does not permit the presentation of adequate abstracts of each paper—only a general summary is possible of both the papers and the discussions, which were animated.

Frank Hodson, as chairman, opened the meeting with an appropriate brief address in which he called attention to the fact that the subject for the session

"is probably one of the most fascinating and yet the most elusive in all metallurgy." Referring briefly to some of the work in the past and to some of the men who have investigated this field, Mr. Hodson said that certainly the ancients, with their simple but crude processes for iron ore reduction, did not have to specify certain grades of pig iron for certain kinds of work. Their reductions were at comparatively low temperatures and their product was far superior to any pig iron now made, as evidenced by some of the metal, hardly equalled today, such as the metal column at Delhi, India, and others.

Two Theoretical Papers

The general subject of the symposium was introduced by two papers, "A Resumé of the Facts Influencing the Rate of the Gaseous Reduction of Metallic Oxides," by P. H. Emmett, assistant chemist, Fixed Nitrogen Research Laboratory, Washington, and "Equilibrium for the Reaction $2\text{CO} = \text{CO}_2 + \text{C}$," by Dr. Alfred Stansfield, professor of metallurgy, McGill University, Montreal. Both papers are contributions to the theory of the processes, the first taking up the temperatures and chemical conditions present, including physical properties of the material, and the second a determination of the efficiency of the reactions at certain temperatures. Doctor Stansfield is a recognized authority on low temperature iron ore reduction.

Steel in "One Process" Direct from Ore

Of the six papers dealing directly with the production of sponge or granular iron, one of the most interesting was entitled "The Manufacture of Steel In

Four of the Vice-Presidents and Managers



F. N. SPELLER



DUNCAN MACRAE



R. L. BALDWIN



B. D. SAKLATWALLA

One Process Direct from Ore," by Oliver Smalley, consulting metallurgist and foundry advisor, New York, and Frank Hodson, consulting metallurgist, Philadelphia.

The authors described two processes that have been developed within recent years by which it is claimed that the production of quality steels in one operation direct from ores are commercially successful under certain conditions. They both originated in Europe. One is known as the Pehrson-Prentice process and the other is the "Carsil" process. The former is the outcome of the cooperative investigation of its Swedish and Scottish inventors and the latter had its genesis in Sheffield, England, being the result of the combined efforts of F. A. de Silva of the United States and C. G. Carlisle of England.

The Pehrson-Prentice process is described as continuous, the ore being reduced in a primary rotary furnace of ingenious and practical design, finishing of the product in an entirely new type of arc-resistance furnace. The "Carsil" process uses the Greaves-Etchell arc furnace with certain modifications and changes in design, which form the subject of a patent while the process itself is also to be protected. Both processes are claimed to achieve the same object and enable the production of high-grade steel, ordinary, alloy and stainless. They differ in that the Pehrson operates in two stages, the initial reduction of the charge to an iron-rich sponge, followed by direct melting, while the "Carsil" process is progressive and of somewhat extended dimensions. The paper is well illustrated with photographs, line cuts and tables, giving the details of both processes.

In another paper by Mr. Hodson and Mr. Smalley, entitled "Development in the Low Temperature Reduction of Iron Ore," this and the previous paper having been presented in an abstract by Mr. Hodson, the authors describe several processes somewhat briefly, including the Greaves-Etchell, a process for converting iron ore directly into steel; the Hornsey process; the Croese and the Edwin processes, as well as the Gronwall and the Flodin method. Some facts are also given about the Bardue process, designed by H. B. Bardue of San Francisco and operated by the Wakama Iron & Steel Co.

Paper Offered from Japan

From Japan came a paper entitled "Gaseous Reduction of Iron Ores," by Heihachi Kamura, department of mining and metallurgy, Meiji College of Technology, Tobato, Fukuoka-Ken, Japan. The author states that, compared with low temperature gaseous reduction of iron ore by carbon monoxide, modern blast furnace operation is inefficient. Furthermore, he states that the excessively high temperatures of the blast furnace bring about reduction of the most stable oxides present, such as silica, manganese dioxide and phosphorous pentoxide, which result in a pig iron con-

taining many objectionable impurities. By reduction, however, with carbon monoxide gas, generated in a separate furnace, a sponge iron is produced, said Mr. Kamura, which is practically free from phosphorus, sulphur and manganese. The fuel consumption for sponge iron thus made is calculated to be 0.3 tons of coke and 0.5 tons of coal, as compared with one ton of coke for pig iron made in the blast furnace. The author's paper is illustrated with photographs, charts and tables, as well as mathematical calculations to prove his contentions.

A Contribution from England

From England a paper entitled "The Direct Production of Pure Iron" was presented in abstract by Doctor Fink, the author being Percy Longmuir, metallurgical engineer, Sheffield. The author reviews briefly the most important results obtained by various investigators in this field since 1910, and states that his experience is such as to lead him to the pessimistic rather than the optimistic view as to the commercial possibilities of direct reduction. He states that the Thomas Rowlands process offers decided advantages over other older ones, the primary advantage being in the direction of the recovery of the whole of the iron present in the ore in a state of metallic purity. The main stages of this process are fully described and the author reports that the iron so produced forms an excellent foundation material for the production of the highest class of straight carbon and alloy steel.

New Swedish Method for Sponge Iron

A Swedish paper was presented in abstract by Mr. Hodson entitled "A New Method for the Production of Iron Sponge" by Martin Wiberg, metallurgical engineer, Falun, Sweden. The author describes semi-commercial tests carried out under gaseous reduction of iron ore, using carbon monoxide plus a little hydrogen as the reducing agent. The author attempts to show that gaseous reduction can be carried out continuously and efficiently, provided the reducing gas is separately generated and then passed over the heated iron ore, and provided also that a large proportion of the circulating gas is removed from the reduction furnace before it enters the preliminary zone. This by-passed gas is then enriched in carbon monoxide by coming in contact with incandescent carbon, and then enters the final reduction zone. The gas escaping from the reduction furnace is stated to run as high as 72 per cent carbon dioxide. A high quality sponge iron is produced analyzing low in sulphur and phosphorous. Low-grade iron ores are suitable for the process and most of the gangue is removed magnetically after the reduction.

Fine-Grained Ores in the Blast Furnace

From Germany a paper was offered by Konrad Hofmann of Breslau, Germany, under the title "The Ad-

Four Prominent Electrochemists in Industry



F. G. COTTRELL



C. F. BURGESS



W. S. LANDIS



F. A. J. FITZGERALD

vantages of Smelting Fine-Grained Ores in the Blast Furnace." The author reports that samples of ferric oxide and magnetite were reduced with hydrogen under carefully controlled conditions and that it was found that the degree of reduction is at a minimum of about 750 deg. C. This is ascribed to the superficial welding together of the reduced grains. He states that there must be taken into account in carrying out gaseous reduction on a commercial scale so-called "passive resistances" which are to be understood as forces opposing complete and rapid reduction. The author in his conclusions compares deductions drawn from the laboratory experiments with results obtained in the United States.

Judgments Differ on the Various Processes

AN animated exchange of views interspersed the presentation of the preceding papers and several prominent metallurgists took part. The general drift of the rather disconnected discussion was about as follows:

Reduced Iron No Better Than Scrap Steel

Asserting that the average product of the direct reduction of iron ore is a very poor one commercially and not worth the price of scrap steel, Prof. Bradley Stoughton, head of the department of metallurgy, Lehigh University, Bethlehem, Pa., was positive that it must be produced at a price below or equal to poor steel scrap, such as turnings. He graphically pointed to the fact that the "cemetery of the direct process is full of many graves" representing unfulfilled dreams and failures in achievement. "I am not opposed to the direct process for iron ore, but we must face the facts."

That the point of view made as to scrap is correct was partly agreed to by William H. Smith, formerly head of the research department Ford Motor Co., Dearborn, Mich., but now consulting metallurgist, Detroit. But there isn't enough scrap, insisted Mr. Smith. He added that the cost of the materials is the important point, one that he believed Professor Stoughton had in mind. It is possible to get pure iron commercially by direct reduction, but the cost must be determined in order to have something to go on, said Mr. Smith, who has developed a process of his own.

Unless the separation of the reduced material from dross is very pure, J. Kent Smith, well-known British scientist and consulting metallurgist, Detroit, said that he could not agree entirely with some of the previous statements, but felt that the inherent value of sponge or granular iron is much greater than scrap. He testified that he has made 25 heats from sponge iron, the results of which speak for themselves.

Nitrogen a Factor in the Final Product

That the cemetery is full of graves was explained by Edwin F. Cone, THE IRON AGE, New York, as being due partly to death from the disease of high costs. He also brought up the question as to the relative amounts of nitrogen in the blast furnace product as compared with the gaseous reduced iron and hence in the final steel. Claims have been made, he said, for the superiority of the latter because of its small content of nitrogen.

This point was answered by C. E. Sims, formerly with the United States Bureau of Mines, Pittsburgh, but now assistant director of research American Steel Foundries, Indiana Harbor, Ind., and also by J. Kent Smith. Mr. Sims' view was that nitrogen in steels made from sponge or granular iron is no lower than in other steels and that it is often introduced into steel made in electric furnaces.

J. Kent Smith, who was called upon, said that nitrogen in steel was an "old hobby" with him, that it is harmful in at least one form and that steels which contain it in this form do not stand up. Occluded nitrogen, he did not consider harmful, but nitrogen as nitrides, dissolved in the ferrite, he pointed to as introducing "all kinds of trouble." It comes into the steel, he believes, as cyanogen in the blast furnace and he cited the fact that cold blast is better than hot blast charcoal iron and that both are better than coke iron. It is unfortunate, he thought, that modern laboratories cannot analyze for occluded as distinguished from the other form of nitrogen in steel, but he expressed a be-

lief that the development of selective etching and the super-microscope will solve this problem.

American Process Being Installed in Japan

The Anderson-Thornhill process was alluded to by Gilbert E. Doan, Lehigh University, Bethlehem, Pa. It is being installed in Japan, he said, where 2400 tons of iron per day is the expected output. The metal is electrically separated after reduction. This process, invented by two Americans in Wisconsin, is being applied to the large deposits of titanium-bearing iron sands in Japan, said Edwin F. Cone, who reported that he has had considerable correspondence with Mr. Anderson about this development. Certain interests



CARL SCHLUEDERBERG



FRANK HODSON

MR. SCHLUEDERBERG, Westinghouse Electric & Mfg. Co., George Cutter Works, South Bend, Ind., had charge of the jubilee session. **Mr. Hodson**, consulting metallurgist, Philadelphia, is chairman of the local section in charge of the convention

in Japan, as already announced in THE IRON AGE, are licensed to use the process. The inventors claim efficiency and low cost and a separation of titanium from the iron.

Sponge Iron Not Readily Oxidized

Rather startling testimony came from C. E. Sims on the oxidizability of sponge iron. Stating that the Bureau of Mines at one time went in great detail into an investigation of the direct reduction of iron ore when he was employed by the bureau, he urged that we all be critical as scientists. He made the statement that it had been experimentally demonstrated that 90 per cent of hot sponge iron was not oxidized when cooled in air.

At another point in the discussion, Mr. Sims reported that phosphorus is not reduced by gaseous reduction at the temperature that iron is, but that sulphur is introduced by absorption, at least, from fuel gases. Phosphoric minerals, however, remain with the sponge iron. Usually in such iron from 0.10 to 0.30 per cent carbon is found as combined and free carbon. Other things being equal, the temperature and size of the material are the largest factors in the reduction to sponge or granular iron. In reducing Fe_2O_3 to 95 per cent iron, there is a volume reduction of about 55 per cent, as this oxide passes to FeO .

An accurate determination of the actual surfaces to be reduced is essential, said F. G. Breyer, formerly with the New Jersey Zinc Co., but now consulting metallurgist, New York. The reducibility rate cannot be judged unless the surface to be reduced is known, and this is particularly true of zinc oxide, he claimed.

Commenting on the paper by Martin Wiberg, Dr. Colin G. Fink, head of the electrochemical department Columbia University, New York, testified that the paper appealed to him as an application of the counter current principle: Weakest gas for the richest ores and the strongest gas for the poorer ores.

That high-grade sponge iron can be obtained from pyrite roast or "blue billy," was called attention to by

Edward F. Kern, professor of metallurgy, Columbia University, New York. By mixing 12 per cent sulphur and sintering, followed by reduction with nitrogen, a fine grade of granular iron is possible, he reported.

Doctor Fink announced that written discussions had been received from Farley G. Clark, consulting engineer, Toronto; from T. L. Joseph, metallurgist, United States Bureau of Mines, Minneapolis, Minn., and R. C. Canby, consulting metallurgist, Wallingford, Conn.

The Round-Table Luncheon Discussion

Special arrangements had been made for a round-table discussion at luncheon following this session. Only a few remained, due partly to the fact that the subject had been pretty thoroughly canvassed in the morning. J. Kent Smith, however, who was scheduled to lead this round-table discussion, was successful in interesting a small group in the subject of iron ore reduction and presented some facts which were of decided interest. Such a discussion, which is never reported nor entered into the records of the society, was participated in also by William H. Smith, Prof. Bradley Stoughton and others.

Tin Obtained by Gaseous Reduction

THE comparatively new development of the gaseous reduction of tin ores containing oxide of tin was presented at the postponed meeting of the original



DR. EDGAR F. SMITH



PROF. PETER DEBYE

PROFESSOR SMITH, head of chemical department University of Pennsylvania, presided at the jubilee session. **Professor Debye**, University of Zurich, Switzerland, was the chief speaker at the symposium on concentrated solutions

session in the form of three papers, one entitled "The Reduction of Tin Oxide and Cassiterite Concentrates," by Edward F. Kern, department of metallurgy, Columbia University; another, "The Gaseous Nature of Carbon Reduction of Tin Concentrates," as well as one entitled "Gaseous Reduction of Tin Concentrates," both by Dr. Colin G. Fink, Columbia University, New York, and Charles L. Mantell, consulting chemical engineer, Pratt Institute, Brooklyn.

Reduction of Tin Concentrates

Professor Kern in the first paper stated that it had been found that stannous and stannic oxides are readily reduced to metal in an atmosphere of illuminating gas, the reduction starting just about 500 deg. C. with rapid reduction above 780 deg. C. The reduction by bituminous coal has been found to be less rapid, occurring at higher temperatures than by illuminating gas, but above 850 deg. C. the reduction is rapid and complete. Reduction by charcoal, the author states, is slower than by bituminous coal. Hydrogen was found to be a more efficient reducing agent for cassiterite than carbon monoxide and the percentage reduction was found to decrease in proportion to the

amounts of carbon dioxide and nitrogen in the gaseous mixtures, whereas the efficiency of reduction increased with the decrease in the amount of carbon monoxide and of hydrogen in the gaseous mixture.

Discussion

In the discussion of this paper Mr. Mantell disputed the results which Doctor Kern had obtained as to the reduction of stannous oxide. This is not a reduction as ordinarily understood, he said. By heating stannous oxide without any reducing agent one obtains only 50 per cent tin as metal. Doctor Fink referred to the experiments with solid carbon, coke, coal, etc., and cited tests which indicated rather conclusively that the reduction of cassiterite could not take place between solid carbon and solid tin oxide, but that the reduction was entirely due to carbon monoxide. He further emphasized the outstanding physical and chemical properties of metallic tin and tin oxide. In contradistinction with iron and other metals, tin is efficiently reduced at temperatures above its melting point and the product can be readily removed from the sintered gangue material. The tendency for tin oxide to dissociate at high temperature is extremely small as compared with that of iron oxide or copper oxide.

Mr. Mantell described an experiment in which he mixed tin oxide with solid carbon and heated the mixtures to high temperatures in the absence of air. No reduction took place. Similar experiments with copper oxides resulted in the reduction to copper due to the dissociation of cupric oxide and the reaction of the oxygen with the incandescent carbon to form carbon monoxide, which in turn reduces some of the cuprous oxide.

Gaseous Reduction of Tin Oxides

The first paper by Doctor Fink and Mr. Mantell on the gaseous nature of the carbon reduction of tin concentrates is based on experiments carried out at Columbia University. These led to the conclusion that in general "solid carbonaceous fuel reduction of reducible metal oxides is gaseous in its mechanism. Carbonaceous reduction requires higher temperatures than gaseous reduction, as the carbon must first be gasified at a rapid rate."

In the discussion Professor Kern referred to the splendid work of Mr. Alexander of the American Smelting & Refining Co. in the development of tin smelting in the blast and reverberatory furnaces.

The other paper by Doctor Fink and Mr. Mantell on the gaseous reduction of tin concentrates covers elaborate investigations on the reduction of tin oxide and tin concentrates by hydrogen and carbon monoxide. Present reverberatory and blast furnace practice requires temperatures of 1300 to 1400 deg. C., whereas hydrogen reduction may be effected beginning at 250 deg. C. with the most economical point between 750 and 800 deg. C. Quoting the authors:

Using hydrogen for tin concentrates reduction, a rough estimate of the power consumption is based on the following factors: One pound (454 grams) of metallic tin requires for its reduction from cassiterite (SnO_2), 6 cu. ft. (170 liters) of H_2 gas. One kw. produces 7 cu. ft. (199.21) of H_2 gas by the electrolysis of water. The theoretical value is about 9 cu. ft. (255.1). The power requirements for H_2 production are therefore 0.86 kw. per lb. of Sn metal, or 1030 kw. per ton of 60 per cent Sn concentrates.

Discussion

Discussing this paper, William W. Winship of the Thermal Syndicate, Ltd., suggested the use of quartz apparatus for the reduction of tin oxide. Mr. Mantell replied that experiments with cassiterite at 1000 deg. C. resulted in a hole in the quartz tube but that at lower temperatures the material might be very serviceable. He stated also that tin reduction can be carried out in glass at low temperature, with failure of quartz at 1000 deg. C. being due possibly to complicated reactions involving devitrification. Frank Hodson, consulting metallurgist, Philadelphia, considered the consumption of 1930 kw. per ton of 60 per cent concentrates rather high. He felt that the direct application of electric heat would be more efficient.

Farley G. Clark, consulting engineer, Toronto, who for the past ten years has been investigating the possibilities of hydrogen reduction, complimented the

authors on their findings, but considered the process more applicable to Nigerian and South African tin ores. If reasonably cheap power can be had in India, the gaseous reduction should be adaptable to Malay tin ores. He stated that there is little hope of getting power in Bolivia at less than 1c. per kwhr., but, of course, it is not essential that the concentrates be reduced in Bolivia.

In the case of Portuguese stream tin using both hydrogen and carbon monoxide as reducing agent, Clark obtained a reduction cost of \$19.30 per ton of 65 per cent concentrates. However, the recovery of the other metals present, bismuth, antimony, lead, copper, etc., presented considerable difficulty. "Something is needed to deal with Bolivian concentrates, to remove the stranglehold of the British smelters and to ap-

per kwhr., the recovery of 97.5 per cent of the tin in the concentrate can be had at less than \$30 per net ton, including all costs.

During the short session on corrosion toward the close of the convention on Saturday, Messrs. Mantell and King discussed the reversed potentials in the corrosion of tin plate. Their results were commented upon by A. E. Stevenson and W. W. Murray, of the Continental Can Co. of Chicago.

Zinc Ores Reduced by Gases

THE question of a problem of the gaseous reduction of zinc ores was discussed in two papers, one entitled, "The Gaseous Reduction of Zinc," by Charles G. Maier and Oliver C. Ralston, metallurgist and superintendent respectively, Pacific Mining Experimental Station, Berkeley, Cal., and the other, "The Mechanism of the Metallurgical Production of Zinc," by Max Bodenstein, professor of physical chemistry, University of Berlin, Germany.

The first of the two papers gives consideration to some of the theoretical phases of the subject, including data on the thermodynamic properties of zinc oxide, which enable the calculation of the reduction equilibrium to a considerable certainty. General considerations relative to the implication of results with respect to present practice and future possibilities are discussed. In the other paper, the one from Germany, the author states that in the past the reduction of zinc oxide by carbon has been regarded as taking place between two solids. By carefully following the course of the reduction and analyzing the gaseous products formed, the author claims that the reduction proceeds in two stages. His results, as pointed out, prove conclusively that the reduction of zinc oxide is a gaseous reduction.

Discussion

In the brief discussion which followed, F. G. Breyer, consulting metallurgist, New York, stated that, in his opinion, the conclusions offered in the paper by Messrs. Maier and Ralston, are fallacious and based upon fundamental error. In reference to both papers, Mr. Breyer stated that he had no quarrel with the authors as to their work based on theory, but he believed that the value of any theory depends upon the results obtained. There is too much theory offered at present in many cases, and not enough experimental data based on facts. He stated that there is more to be gained by assuming that zinc oxide and carbon react when present in close physical contact.

Reduction of Molybdenum and Tungsten by Gases

The same program contained papers on the treatment of molybdenite ores by leaching, on the reduction of pure oxides and salts of tungsten and molybdenum and on the gaseous reduction of oxides of tungsten and molybdenum. There was a paper also on the reduction of copper oxide by gaseous reducing agents.

Electric Furnace Papers

Two papers in the electric furnace field included one entitled, "High Speed-High Frequency Inductive Heating," by E. F. Northrup, Ajax Electrothermic Corporation, Trenton, N. J., and one entitled, "The Minguet Electrode and the Minguet Furnace," by Marcel Arrouet, Société Metallurgique de Montricher, Paris, France.

Other Sessions and Features of the Convention

A FEATURE of the convention which attracted considerable attention was a symposium on "Electrochemistry of Concentrated Solutions," organized and presided over by Prof. Hugh S. Taylor, professor of physical chemistry Princeton University, Princeton, N. J. Five papers were presented on various phases of the subject after an address by Prof. Peter Debye, professor of physics, University of Zurich, Switzerland, on "The Dielectric Constant of Electrolyte Solutions." Professor Debye is of Dutch ancestry and delivered his lecture in splendid English. The discussion following the address and papers was particularly animated.

At a special technical session on Saturday morning, April 30, on electrodeposition, presided over by Doctor Blum 11 papers were scheduled. Among these may be mentioned "Practical Uses of Pure Nickel," by R. J. McKay, superintendent of technical service International Nickel Co., New York; "Pure Zinc," by H. M. Cyr, research division New Jersey Zinc Co.; "Bright Dipping of Metal," by A. Kenneth Graham, University of Pennsylvania, Philadelphia; "Note on the Crystalline Structure of Electrodeposited Chromium," by Frederic Sillers, Jr., scientific aid United States Bureau of Standards, Washington; "On the Properties of Elec-

New Officers

President, one year:

Dr. S. C. Lind, director school of chemistry, University of Minnesota, Minneapolis, Minn.

Secretary, one year:

Dr. Colin G. Fink, Columbia University, New York.

Treasurer, one year:

Acheson Smith, vice-president and general manager, Acheson Graphite Co., Niagara Falls, N. Y.

Vice-Presidents, two years:

Duncan MacRae, manager, research laboratories, Guggenheim Brothers, New York.

Paul J. Kreusi, president Southern Ferro Alloys Co., Chattanooga, Tenn.

Robert Turnbull, consulting engineer, Niagara Falls, N. Y.

Managers, three years:

Oliver C. Ralston, assistant chief metallurgist U. S. Bureau of Mines, Pacific Experiment Station, Berkeley, Cal.

R. L. Baldwin, manager of sales, Republic Carbon Co., Niagara Falls, N. Y.

Hugh S. Cooper, laboratory director, Beryllium Corporation of America, Cleveland.

portion to the average Bolivian miner his rightful part of the sale price of tin."

Electrolytic Reduction of Bolivian Concentrates

Concluding his discussion, Mr. Clark described briefly an electrolytic reduction process which has been applied to Bolivian concentrates with economic results warranting the belief that the United States tin market can be freed from the nightmare of the progressively increasing cost of tin. A test run with a concentrate containing 76.26 per cent SnO_2 , 10.13 per cent iron, 7.51 per cent SiO_2 , 0.53 per cent Al_2O_3 with the small percentages of sulphur, bismuth, lead, antimony and lime, and with an allowance made for furnace soakage, delivered 80 per cent of the tin in the concentrate as 97.975 per cent, or premium tin, and 17.5 per cent as 99.75 per cent tin. A thorough testing out of this electrical process indicates that with coal at \$15 per net ton, electrodes at \$160 per ton, limestone at \$12 and silica at \$5 per ton, with electrical energy at 1c.



DR. C. G. FINK



DR. S. C. LIND



ACHESON SMITH

**Newly Elected
Officers for the
Ensuing Year:
Doctor Fink
and Mr. Smith
were Reelected**

trolytic Copper Sheet," by S. Sonoda, Inari, near Kyoto, Japan, and "The Protective Value of Nickel Plating," by C. T. Thomas and William Blum.

Honorarium Given to Secretary Fink

IN recognition of the untiring zeal and amount of work which the secretary of the society has freely devoted to the many details of his office for the last five years, the board of directors, at a brief business meeting following the luncheon on Friday, April 29, presented to Doctor Fink a check for \$1,000. In notifying the recipient of the unanimous vote of the board, Doctor Blum paid a graceful tribute to the secretary. At this luncheon the result of the election of officers for another year was announced, as printed in another column and Dr. William Blum, the retiring president, delivered a splendid address on "Industrial Research, the Bridge Between Science and Industry." An ab-

stract will be published in a later issue of THE IRON AGE.

Visits to industrial plants were liberally patronized and included the Leeds & Northrup, Atwater-Kent, Victor Talking Machine and Brown Boveri plants, as well as the Philadelphia Navy Yard.

Future Conventions

The next annual spring meeting of the society will be held at Bridgeport, Conn., in April, 1928, and the fall meeting for that year will take place, probably in September, in Toronto, Canada. As previously announced in THE IRON AGE, the fall meeting this year will be a northwestern trip starting at Chicago, Sept. 4 and returning Sept. 20, including visits to many metallurgical, smelting and refining plants, as far west as Washington and into British Columbia. Several foreign members have signed up for the trip.

STEEL IN DWELLINGS

Fireproof Brick House Has Steel Beams, Rafters, Stairs and Casements

About a year ago THE IRON AGE published a series of articles on the use of steel in residence building. Some of these contemplated making the walls of that material. Others were of steel frame and still others used steel for floor beams, rafters, etc. A recently built house at Great Neck, N. Y., and described in *American Architect*, is of the latter type. The design was worked out carefully with the idea of building of permanent, fire-resisting materials, within the cost of houses of more usual construction.

In the present design, the new J. & L. Junior beams were used throughout for floor framing and for plates and rafters for the roof. All windows were steel casements in steel frames. All stairs were built of steel, those in the basement being of open riser type with checkered plate treads. Stairs above this used steel risers and steel treads, the latter covered with oak treads bolted on. Outside walls are of brick.

Floor construction is interesting, consisting of a grid of 6-in. Junior I-beams about 30 in. on centers, with a gypsum board laid across the top, 21-in. x 2-in. wooden sleepers placed 16 in. on centers above the board and the slabs between sleepers filled with gypsum poured in to a thickness of 2 in., on steel reinforcing. The finished wood floor is then laid on top of the gypsum and nailed to the sleepers. On the under side, ¾-in. steel channels about 16 in. apart are carried across and clipped to the beams, with metal lath and the ceiling plaster attached to these channels.

Total construction cost, including all items usually covered by the general contract, is reported at 52c. per cu. ft. It is not possible to segregate the steel

items completely, but the structural steel for floors, roofs and lintels was 6.7 per cent of the total cost, and the stairs were 2.3 per cent, not including the wooden treads and hand rail. The steel sash, glazed and including the sash hardware, accounted for 2 per cent. These three items made up 11 per cent of the total cost.

Persistency of Employees

Experience data from a Pennsylvania manufacturing concern hiring about 200 employees a year have been translated into curves of persistency of staying on the job. This curve is published in the Executives Service Bulletin of the Metropolitan Life Insurance Co. It is based on the number of weeks elapsing between connection with the plant and time of leaving. The employees were rated in two age groups, one being under 16 years and the other over 16. The older element left much more rapidly than the younger. At the end of 13 weeks, the departures of the youngsters amounted to about 47 per cent of the total entering group, while the older group had lost 68 per cent. The average was about 62 per cent. The curves flattened out considerably after this period until, at the end of two years, there remained in the organization about 11 per cent of the older employees and 28 per cent of the younger, an average of a little over 16 per cent of the total.

A main driving belt that is claimed to be the largest rubber transmission belt in the United States has been purchased from the Security Rubber & Belting Co., Chicago, by the Bryant Paper Co., Kalamazoo, Mich. This belt will be 142 ft. 6 in. x 72 in. x 12 ply and will weight about 1½ tons. It will handle a load approximately 1100 hp.

What Size Ideal Inventory?

Purchase of Raw Materials, Control of Work in Process,
Changes in Design and Variation of Output
All Relate to Inventory Balance

REDUCTION of inventories was emphasized as the keynote in lowering manufacturing costs at a meeting of the production executives division of the American Management Association held with the cooperation of the management division of the American Society of Mechanical Engineers and the Detroit section of the Society of Automotive Engineers at the Book-Cadillac Hotel, Detroit, April 27-29. While other points such as the purchase and inspection of raw materials, the planning and control work in process, the training of workers and economies during change of design or variation in rate of output were considered, the discussion seemed invariably to revert to the control of inventories. The policy of an ideal inventory condition by a reduction to zero was advocated but most companies favored a balance between purchases, production and sales which would give the highest possible turnover without recurrent losses through failure to make deliveries at the specified time.

Key Points in Expenditure Control

A PLEA for measuring devices by which to determine the relative importance and possibilities of the hundreds of small details which complicate the problem of controlling manufacturing expenditures was made by Oscar Grothe, vice-president White Sewing Machine Co., Cleveland, in the first paper presented on Wednesday. He dealt fully with the various points in manufacture by which his own company had sought to control expenditures, emphasizing location, size and type of factory building, purchase of materials, flexibility of production, inventories, consolidation of departments and simplification, incentives and assignment of labor, budgets, source of power, losses through scrapping and the education of workers, closing the paper with the statement that additions to the staff of clerks who keep records of manufacturing performance were usually an investment which paid high dividends.

A paper by Wallace Clark, consulting management engineer, New York, on "Procedure for Locating Cause of Unnecessary Expenditures and for Indicating the Executive Action for Their Control," was read in the author's absence by W. J. Donald, managing director of the association, and had to do principally with the selection of the person or persons who should be held responsible for accomplishing the aims mentioned in the preceding paper.

H. P. Sailor, production engineer Hupp Motor Car Co., Detroit, who led the discussion, questioned the elimination of the foundry as a factor for the reduction of manufacturing costs. Willis Wissler, bureau of business research, Ohio State University, Columbus, answered the question by telling of the experiences of his department in its study of manufacturing problems in central Ohio, and stated that a number of companies had found it advisable either to sell their foundries or lease them to other parties, finding it much cheaper to buy castings. He stressed extreme flexibility in production schedules and suggested scientific market analysis as one of the most potent factors in the control of business costs.

That the foundry is a necessity in order to get the right sort of castings for specialized manufacture was the statement of Howard Lincoln, works manager Sullivan Machinery Co., Claremont, N. H., who also strongly favored the incentive plan of employing labor. Frank H. Fanning, director of budget, American Rolling Mill Co., Ashland, Ky., suggested the formulation of an index of all manufacturing costs, at the same time admitting

the improbability of ever reaching such an end completely.

Eliminating the Storeroom

WITH the subject, "A Purchasing Schedule That Abolished Storerooms," Carl J. Sherer, treasurer Marmon Motor Car Co., Indianapolis, told of the plan by which his company has been able to reduce its inventory materially by the close coordination of raw materials delivery and production. This plan was described at length in *THE IRON AGE* of March 17, 1927, page 769. The discussion was led by Chapin Hoskins, editor of *Factory*, who questioned the adaptability of such a plan to any industry except the automotive, and also stressed the importance of determining the reliability of vendors before attempting such a program. This led to a discussion of forcing the large inventory upon the vendor, and W. J. Cortland, Sparks Withington Co., Jackson, Mich., and H. V. Coes, general manager Belden Mfg. Co., Chicago, expressed the opinion that such a plan would only serve to revert back to a high inventory on the part of the ultimate producer, and not serve to eliminate the problem in any one industry.

Reduction of inventories into terms of days was suggested by J. E. Padgett, assistant general superintendent Spicer Mfg. Co., South Plainfield, N. J., who spoke on "Stores Control of Raw Materials." He told of the experience of his company in bringing inventory into direct proportion to production by the use of this method. He advised against speculation in raw materials and mentioned the importance of training the entire organization to mold inventories to the lowest point, even though the actual control should be given to a single individual. The education of the vendor in furnishing the proper kind of materials for particular needs was brought out, but J. D. Towne, industrial engineer, Dayton Steel Foundry Co., Dayton, Ohio, expressed the opinion that the customer might also be educated to adapt his needs to the economic facilities of the producer.

The desirability of selecting raw materials to the specifications of which the vendor may conform easily was the high point of a paper on "The Quality Inspection of Materials," which was presented at the evening session on Wednesday by L. I. Shaw, Western Electric Co., Chicago. He mentioned the futility of establishing specifications which the vendor cannot meet or is not called upon to meet ordinarily, and also emphasized the unnecessary cost involved in excessive testing of raw materials before using. "The policy of striking a happy medium in the testing of raw materials," Mr. Shaw said, "is cheaper in the long run." He showed with illustrative slides the procedure of testing materials at the Western Electric plant, and also brought out the necessity of regularly testing the testing machines used. Walter B. Coley, plant superintendent Leeds & Northrup Co., Philadelphia, mentioned the success his company had had along these lines by maintaining a close coordination between the engineering and production departments.

Controlling Work in Production

ESTABLISHMENT of a definite schedule of delivery for the production department and actual scheduling of operator hours available in each department were cited as the outstanding feature of the plan used to control work in process in the plant of the Belden Mfg. Co., Chicago, by C. S. Craigmile, its assistant superintendent. He stated that such a program enabled each manufacturing division to have work at all

times and also provided a simple method of checking back each failure of delivery upon scheduled time. Frank H. Fanning described a similar plan in operation at the American Rolling Mill Co. plant. In this case an ideal schedule of production and costs was arranged at the beginning of the year and divided into weekly periods. Actual orders were compared with this ideal schedule at regular intervals, and profits could thus be separated according to their responsibility. A. H. McNaughton, works auditor Fairbanks, Morse & Co., Chicago, stated that the practice of that company is to write off cost variations immediately as profit or loss and thus establish definite production calculations.

J. B. Jones, Goodman Mfg. Co., Chicago, questioned the possibility of maintaining such cost standards on the 40,000 different items manufactured by his company. Mr. McNaughton replied that standards on each item are established at the beginning of the year in the Fairbanks, Morse organization, which plans had been adhered to with gratifying results.

The figuring of production schedules on a basis of man-days was introduced by J. D. Towne, of the Dayton Steel Foundry Co. He said that all process work was controlled by the production department, which issued definite shop schedules each week. Available labor-hours are scheduled or budgeted, and the time required to do the work is determined in advance by means of a chart which the company has formulated, calculated to fix the number of labor-hours required on its various products. In this manner the number of hours which should have been required for a given job is used for a standard of comparison to actual production performance and any failures immediately traced. Such a procedure makes the inclusion of labor costs in the expense budget for each week a more or less definite factor. This plan, Mr. Towne pointed out, has enabled his company to lower its costs and increase production and at the same time to give its customers the advantages of lower prices and prompt delivery.

The manload budget sheets used in calculating the number of labor-hours needed for a job were distributed for examination, and the speaker explained the method of calculation, stressing the point that the workman was never expected to be 100 per cent efficient but merely to conform with previously justified labor standards.

Relation of Accidents to Production

THE results of an investigation of the relation of safety to production conducted by a committee of the American Engineering Council were presented by W. W. Nichols, D. P. Brown & Co., Detroit, at the afternoon session on Thursday. The investigation, which covers the period from 1921 until 1925, inclusive, shows the comparative production performances of various industries during the period together with the per cent increase or decrease in accident frequency and severity rates. The iron and steel industry with increasing rate of production showed a decrease in both frequency and severity of accidents. In the machinery and metal working industries the production figures were somewhat at variance in the different groups, but in most cases showed a reduction in the accident severity rate with a slight increase in the frequency of lost-time accidents. It was stated that the results of the survey will be published in detail by the engineering council at an early date. W. B. Minch, Jackson Steel Products Co., Jackson, Mich., in commenting on the report mentioned the wave-like nature of the occurrence of lost-time accidents. He also stressed the importance of tracing accidents to the personal life or experience of the worker, and suggested the linking of the safety and personnel departments of a plant.

Production control was dealt with again at this session by William A. Rome, production manager Black & Decker Mfg. Co., Towson, Md., in a paper dealing principally with the experiences of his own company. A summary of the discussion on this topic might be made with the statement that no definite general standards may be set up for any single industry, the matter being largely a problem for each individual company.

At the banquet Thursday evening Frank J. Tone, president Carborundum Co., Niagara Falls, N. Y.,

spoke rather optimistically on the subject of industrial conditions in Russia, while H. V. Coes, Belden Mfg. Co., Chicago, brought out the implausibility of attempting to run a plant without the assistance of an engineering and estimating department.

Training the Worker

THE importance of constant training of foremen and veteran workers as well as apprentices was brought out by Walter S. Berry, director of training, Scovil Mfg. Co., Waterbury, Conn., at the Friday morning session. He favored the plan of grouping apprentices during their training period and the careful teaching of foremen to continue this training in a personal way after the apprentice is advanced to skilled work in the shop. Albert Sobey, director General Motors School of Technology, Flint, Mich., stressed the careful choosing of men for different sorts of training and called attention to the vast amount of waste in the automotive industry alone which can be laid to the improper training of foremen.

Control Under Changing Conditions

E. E. Vender, manager of the Detroit systems staff of Ernst & Ernst, had as his subject, "Controlling Avoidable Manufacturing Expenditures During a Change in Design," emphasizing particularly the procedure of the automotive industry. He reached the conclusion that such changes may be made most economically by a comparison of costs after having determined a definite program of procedure. T. R. Jones, Cincinnati Milling Machine Co., Cincinnati, stated that in his experience definite planning was futile, it being impossible to figure actual costs until a model had been made which would fulfil the desired need.

Careful budget control was pointed out as the secret of regulating manufacturing expenditures during a change in production rate in a paper by H. G. Perkins, industrial engineer Chrysler Corporation, Detroit, which brought the convention to a close. He cited labor, materials and manufacturing burden as the most essential points in the conduct of operations under changing schedules of output, and mentioned burden as the most troublesome. "Here," he said, "budget control might be used to a positive advantage and all successful companies are using it in some form even though disguised by another name."

Some exception was taken to Mr. Perkins' statement that labor may be controlled automatically by the use of the incentive plan, and it was brought out that companies which paid their labor a fixed hourly rate without premiums were forced to meet labor conditions of an entirely different sort from those met under the incentive plan.

National Museum of Engineering and Industry Holds Annual Meeting

The National Museum of Engineering and Industry held its third annual meeting at its headquarters in the Engineering Societies Building, 29 West Thirty-ninth Street, New York, on Thursday afternoon, April 28. Preliminary to the meeting the members tendered a luncheon at the adjoining Engineers Club to the presidents and secretaries of societies represented on its board of trustees, including the national societies of civil, mining, mechanical and electrical engineers and the American Chemical Society. The Smithsonian Institution, of Washington, of which the National Museum of Engineering and Industry will be a part, and the Museum of the Peaceful Arts of New York were also represented.

The following trustees were elected: L. P. Alford, B. C. Batcheller, George M. Bond, Nicholas F. Brady, Ericsson F. Bushnell, Fred H. Colvin, F. A. Halsey, Thomas T. Hoopes, Prof. D. C. Jackson, Joseph Keller, Fred R. Low, H. P. Merriam, H. F. J. Porter, Dr. M. I. Pupin, Dr. Elmer A. Sperry, Kirby Thomas and F. A. Waldron. Thomas Ewing, former commissioner of patents, is president, and Harrison W. Craver, librarian United Engineering Societies Library, New York, is secretary.

Research Active In Welding Field

Investigations of Several Companies and Plans of Welding Bureau Told at Annual Meeting—Data Presented on Production Welding

RESearch—past and future—was dominant in the deliberations of the annual conventions of the American Welding Society and the American Bureau of Welding, the research department of the Society, held at the Engineering Societies Building, New York, April 27-29.

Two technical sessions were held, one devoted to a symposium on the research activities of various companies during the past three years, and the other devoted to applications of welding to production work. Research was also discussed at the meetings of the gas, electric arc, and pressure vessel committees. The major research program of the Welding Bureau relates to the welding of structural steel, pressure vessels and rail joints, and also to specifications for welding wire, as noted below. Entertainment features were provided and a dinner dance was held at the Hotel Commodore.

Application of Welding Furthered By Research

A large amount of scientific and technical research in the field of welding by individual companies was reflected from the symposium which opened the first technical session of the Society's meeting.

Welding research of the General Electric Co., was described by D. H. Deyoe, electrical engineer of the company, which is a large user, as well as a manufacturer, of welding equipment.

A number of welding machines developed by the company, including a new magnetic-clutch type of automatic welder, a multiple arc automatic welder and machines developed by the company for the welding of side seams of tanks and pipes ranging in size from small ice cream cans to large pipe 30 ft. long, were briefly described and illustrated by means of slides. Circular seam welders for range boilers and tanks were also described. A great deal of research work has been done to determine the best grade of steel to use and the proper ingredients of the flux for different grades of electrodes. A metallic sheath-covered fluxed electrode for use in automatic welders, and a sheathed wire for use on cast iron and overhead welding have been developed. A new bare welding electrode for the general welding of steel has also been produced.

Studying Metallurgical Aspect of Welding

Study of welding from a metallurgical standpoint is being made, attention being concentrated at present on the plate to be welded. The program includes a study of the welding current on the quality of the weld, particularly as to ductility, also the effect of the structure of the electrode on the arcing characteristics of the electrode.

Copper tungsten resistance welding electrodes have been developed and are now available for use in manufacturing. The compressive strength of this material, which is named Elkonite, was said to be 208,000 lb. per sq. in. as against 58,000 lb. per sq. in. for hard copper. It was pointed out that one of the limiting features in many resistance or spot welding operations has been the copper electrode employed, the tip of which, when used under the high pressures and high currents common to this type of welding, would roll and mushroom over the edges. This mushrooming, it was said, gives a large spot weld which changes the current density and consequently the quality of the weld.

Railroad Ties Made From Worn Rails

Another line of research and development work that proved of interest was the construction of railroad ties

by arc welding from worn and discarded rails. A number of sample ties were installed about a year ago in the Glenville yards of the Delaware & Hudson Railway Co., and, having proved satisfactory, these metal ties will be substituted for wooden ties in yards and sidings of the railroad company, which plans to install equipment for the construction of these ties.

It is claimed that the all-steel arc-welded railroad tie is not only ten times stronger than the wooden tie, but that the cost is low. The life of the metal tie is also thought to be more than three times that of the wooden tie. The tie plate is the same as that used for the wooden tie, and is welded automatically to the rail. An automatic welding and clamping machine has been developed, the production from which is estimated as 15,000 completed ties a year.

The structural steel welding investigations made by the Westinghouse Electric & Mfg. Co., East Pittsburgh, details of which have been given in these columns during the past year, were outlined briefly by A. M. Candy, engineer of the Westinghouse company. The company plans to erect another building at Corry, Pa.

Tests have been made by the research department of the company to determine the change in the physical strength of weld metal at high temperatures. The results were said to show that while the tensile strength is reduced 25 per cent, the elongation is increased more than 50 per cent, and the reduction in area over 50 per cent, when the weld metal is heated to more than 850 deg. Fahr. An investigation is in progress to determine the effect of welding on shafting. The study includes fatigue tests, mechanical hammering and heat treatment tests.

Shipyard Conducts Investigations

Some of the welding research conducted by the Newport News Shipbuilding & Dry Dock Co., Newport News, Va., was described in a paper by J. W. Owens, director of welding of that company. The resistance, gas, electric arc and thermit welding processes are employed by the company and 12 tests involving the use of these were described.

Among the reasons given for conducting any specific research or test were: To obtain fundamental information on welding; to test new or untried welding processes, equipment and supplies; or to try out a welding process on some specific job to determine suitability, relative costs, etc. Other reasons for the tests are: To convince a customer or a Classification Body; and to educate the company's executives and employees.

One test was made to determine the technique of spot welding galvanized iron, No. 24 to No. 11 gage. Several specimens of the galvanized sheets were welded, and this welding was said to have been found not only entirely practicable but very satisfactory. It was stated that the requirements for successful welding of this type are rounded die points, twice the current and half the pressure required for black metal. The zinc adhering to the electrode points should not be removed and the points should be kept in shape by frequent filing, said Mr. Owens.

The best technique for the flash welding of tungsten steel tips to medium carbon steel shanks in the manufacture of lathe and planer tools was also studied, as well as the serviceability of such tools as indicated by bending and service tests. It was stated that it was found that these tools could be manufactured and broken tools salvaged on the equipment available, the cost of manufacturing such tools being approximately

only one-third that of tools made entirely of tungsten steel.

Another series of tests was made to determine the strength of Tobin and manganese bronze welds in cast iron. Test results, given in tabular form, showed that such welded joints have high strength, being in all cases higher than that of the base metal.

To determine whether fillet welds made by the metal arc will pull the faying surfaces of lap joints in intimate contact, was the object of another series of tests. The conclusion reached, as stated by Mr. Owen, was that intermittent and continuous fillet welds will progressively pull the faying surfaces of a joint together.

A number of corrosion tests of welded material are being made, the period of test being of too short duration to permit of definite conclusions as yet. An interesting graph showing the average ultimate strengths of fillet welds per linear inch, as obtained by various investigators, was included in the paper.

Fatigue of Welds Investigated

"Fatigue of Welds," a paper by R. R. Moore, chief physical testing branch, War Department, Air Service, McCook Field, Dayton, Ohio, was an important contribution to the meeting. Because of Mr. Moore's absence, his paper was presented in abstract only.

"Very little attention has been paid to the effect of repeated stresses on the life (fatigue) of welded joints," said Mr. Moore. "With the application of welding to the members of rotating and reciprocating machinery and to structures subjected to vibration, the fatigue of welds becomes an important consideration.

"A particular example of a structure subjected to considerable vibration is the fuselage of an airplane. The tendency today in airplane construction is toward the steel tube fuselage with welded joints. This type of construction offers the advantages of greater flexibility in design, lightness, low cost, rapid construction and simplicity of repairs. In such work it is rarely necessary to weld metal thicknesses greater than 3/16 in. and usually not over 1/16 in." The tests described in the paper relate to this type of welding rather than the welding of heavy sections.

Data is given in the paper, which was preprinted, on the specimens tested, on the welding procedure and the testing equipment employed. The results of the tests are set forth at length and interesting endurance curves on the various specimens are included. Data given in the curves are combined with tensile test results and presented in tabular form. Another table sets forth miscellaneous data on the properties of the original tubes, the deposited welds and the cast steel. Types of fatigue fractures are pictured and there are several microphotographs, showing the structure of the deposited metals and tubing.

In the concluding paragraphs of his paper, in discussing the existence of endurance limit, Mr. Moore states: "One of the drawbacks to the general acceptance of welding has been a feeling among engineers that the metal deposited under such conditions possessed some undesirable property akin to brittleness which would determine its ultimate failure if long subjected to repeated stresses. The writer made a special effort to obtain some data upon the action of welded metal under a very large number of repetitions of stress to determine whether a metal solidifying under these conditions really possessed such a property as an endurance limit similar to that found in wrought ferrous metals.

"It was found that the deposited metal does have an endurance limit just as wrought ferrous metals do. The evidence is given in Figs. 5 to 7 which show the endurance tests on the deposited gas and arc welds. The arc weld tests are very convincing. Two tests at a stress of 24,000 lb. per sq. in. have completed over 600 million and 700 million cycles without failing. One test at 23,000 lb. per sq. in. has completed 700 million cycles without failing. All tests are still in progress. These tests demonstrate that the deposited weld metal is not inherently weak under stresses repeated an enormous number of times. The 700 million cycles of stress covered in these tests are equivalent to, and in many cases in excess of, the number of cycles encountered during the life of a machine or structure.

Research activities of the Metal & Thermit Corporation, Jersey City, N. J., were outlined by a paper by J. H. Deppeler, chief engineer of the thermit department of the company. Because of Mr. Deppeler's absence his paper, which was preprinted, was read in abstract by W. Spraragen, secretary of the Society.

The research work of this company divides itself into three general classes, only one of which, welding research, is dealt with in the paper. This investigation has to do with the development of iron thermit that will produce steels of the proper physical characteristics. It also includes the development of the other materials in the thermit welding process and the development of a thermit welding technique to produce the best results.

"Much study is given to the various oxides available for the production of thermit, their chemical analysis, physical size, and the results of the proper treatment and blending of these in the processes," said Mr. Deppeler.

The thermit of today is not made of one untreated oxide mixed with aluminum and certain additions, as was the case 20 years ago, but is composed of seven carefully selected oxides mixed and blended in definite proportions, he said. The production of a thermit which under all circumstances, reacts uniformly and produces sound fine-grained steel of high ductility, and tensile strength of over 70,000 lb. per sq. in. and which can be forged, worked and bent double on itself without harm, was given as one of the important results of the researches conducted by the company over the past 10 or 15 years.

Another important result was said to be the development of crucible lining and molding materials to withstand the temperatures of 5000 deg. Fahr., or over, without the introduction of any harmful elements into the steel and without the introduction of gases, which was one of the great faults of the former materials used.

Welding technique has been simplified. This, it was stated, has made possible not only the production of sound, strong welds, even by relatively inexperienced operators, but has also cut the cost of the thermit welding operation in half.

J. J. Crowe, engineer in charge of research and development department of the Air Reduction Sales Co., Jersey City, N. J., outlined the extensive research activity of his company, which spends about \$250,000 a year for this work. Two laboratories are maintained.

In addition to the development of apparatus, studies are made of gases used in the oxy-acetylene industry, fluxes and of material employed in connection with the welding and cutting equipment. Considerable study has been made of welding rods, and torches have received a great deal of attention. When a new alloy appears on the market, study is made of the correct manner of welding it. Among the researches published by the company in the past year are those relating to the welding of tool steel and the cutting of cast iron. Another was on increasing the purity of oxygen.

Effect of Temperature on Welding Wire Studied

Research activities of the Page Steel & Wire Co., Bridgeport, Conn., were outlined by C. A. McCune, director of research of the American Chain Co., an affiliated organization.

Welding wire forms the major portion of investigations relating to fusion welding. The research starts with the making of the steel and includes all processes up to the use of the wire in welding. Magnetic testing, both of the welding wire and base metal, is employed. Studies are being made of the effect of temperature on the welding wire.

The comprehensive studies of welding machines, welding rods, rail bonds and bonding processes, and of rail joint welding, conducted in the laboratory of the Una Welding & Bonding Co., Cleveland, were described briefly by R. B. Fehr, development engineer of the company.

A 35-ft. roof truss, studied in conjunction with the Austin Co., Cleveland, was pictured by slides, half of this truss having been welded by the metallic arc process and half by the carbon arc process, in order to obtain comparative cost data. In tests with a similar riveted truss, the riveted and welded mem-

bers were said to have failed at about the same time and place. A welded 50-ton crane girder was also studied, as well as a welded steel column, which was interesting because of the long welds and the problem of warpage. It was stated that no trouble was encountered from warpage. The welding of rail joints was briefly discussed.

The development of high-strength welding rods, welds made with which were claimed to give 80,000 to 90,000 lb. per sq. in., were stressed by J. R. Dawson, metallurgical engineer of the Union Carbide & Carbon Laboratories, Long Island City, N. Y., in his outline of the research activities of his company. Development of standardized welding procedure was also emphasized. Mr. Dawson directed attention to the development work of men in the field, saying that considerable credit for the advancement of welding should be given to those men, and to the men in the laboratory.

Welding Bureau's Program Comprehensive

THE progress made by the various research committees of the American Bureau of Welding were outlined by committee chairmen, and plans for further investigational activity were discussed at a meeting of the Bureau April 27. Dr. C. A. Adams, professor of engineering, Harvard Engineering School, Cambridge, Mass., and director of the Bureau, presided at the meeting.

The present committees of the Bureau are the structural steel welding, pressure vessel welding, welding wire specifications, and the committee on welded rail joints.

Considerable progress has been made by the structural steel welding committee, which is headed by J. H. Edwards, assistant chief engineer of the American Bridge Co., New York. A subcommittee on "literature," recently appointed, has made a critical digest of existing test data in this field, which data will probably be published during the coming year. A subcommittee on "tests" has laid out a program of investigations to secure fundamental design data as to the unit strength of welds subjected to different processes for various thicknesses of metal and types of joints. A subcommittee on "welding procedure" has prepared a tentative specification covering welding and inspection technique to be followed in making up each of these specimens. It is planned to have some 15 structural steel shops in different parts of the country make up test specimens, which will be tested at governmental, university and company laboratories.

A joint pressure vessel welding research committee, E. H. Ewertz chairman, has been organized under the auspices of the A. S. M. E. and the A. B. W. This committee includes representatives from both organizations, as well as other interested scientific and engineering societies, representatives of welding apparatus makers and tank manufacturers. A subcommittee on "tests" has laid out a tentative program of investigations, including types of tanks needed and also test specimens. Another subcommittee on "welding procedure" will specify in detail the exact welding technique to be followed in making up these tanks and specimens. Mr. E. H. Ewertz is general manager of the Moore plant of the Bethlehem Shipbuilding Corporation, Elizabeth, N. J.

A number of samples of welding wire have been collected from various parts of the country by the welding wire specifications committee, of which C. A. McCune, American Chain Co., is chairman. These samples are being subjected to metallurgical and other examination to determine, if possible, why some of this welding wire is classed by the users as "bad."

The activity of the committee on welded rail joints during the past year has been confined largely to investigations seeking to improve the seam welded type of joint and to measurements of stresses in various parts of rail joints under varying degrees of surface conditions and also under test conditions. Two progress reports have been published during the year.

In addition to the structural steel and other researches, the Bureau plans to conduct a series of fundamental welding investigations, such as "what can be done in heat treatment and forging of welds?" etc. A number of universities have been approached with the object of sounding out their interest in a selected list of fundamental welding problems.

Study of corrosion of welds was discussed. J. C. Lincoln, of the Lincoln Electric Co., described some experiments with the carbon arc, this material being offered as perhaps giving a clue as to what happens in the arc.

The officers of the American Bureau of Welding were reelected. They are: Dr. C. A. Adams, director; H. L. Whittemore, chief of engineering, mechanics' section, Bureau of Standards, first vice-director; A. D. Risteen, second vice-director, and W. Spraragen, technical secretary of the American Bureau of Welding, secretary.

Welding Used in Manufacturing

SPECIFIC applications of the various processes of welding to production work were outlined in a series of short papers presented at a symposium of production welding at the second technical session of the welding society. These applications included the welding of stern frames, welding of furniture and of aluminum automobile bodies. There was a discussion of the use of welded structural and machine parts in place of castings, and of the application of welding to steel residential construction. Data were also presented on some developments in resistance welding.

The use of thermit welding for production purposes was described by J. H. Deppeler of the Metal & Thermit Corporation, Jersey City, N. J. The use of this process for production work began, it was said, in the production welding of stern frames. The thermit process is being used in building up rudders for ships, and for adding parts that are worn. New stocks are welded to old rudders and arms not integral with the stock are welded to the rudder. Other uses include rail welding and welding of pipe up to 6 in. in diameter. In connection with the later, thermit welded pipe coils made up of 2 in. standard pipe, for installation in oil tankers, were pictured and described.

For steel mill work, a number of new thermits have been developed, one of which was said to have unusual hardness, reducing wear. The hard thermit is used for building up worn wobblers. Several slides showing the method of thermit welding these worn wobbler ends were shown, the weld being made with the roll in the vertical position. Crankshafts built up from forged and rolled steel sections with thermit steel webs, these shafts being for oil engines and of small throw, were described. A thermit welded structural beam was another application pictured. It is claimed that it has been found that the weld is of the same strength as the beam if the reinforcement is left on.

Experiments have been made in the thermit welding of long seams. A drum 24 in. in diameter, 36 in. long and of material 2 in. thick was welded along the 36 in. seam. One end of the tank was spun in and the other end spun out, and it was said that the drum could be distorted as one pleased. It was stated that the application of this development has not as yet been determined, but the seam can be thermit welded and the tank machined, etc., without danger to the weld.

Outlines Developments in Resistance Welding

Interesting data relating to developments in resistance welding were given by H. W. Tobey, electrical engineer, General Electric Co., Pittsfield, Mass., in a paper on "Resistance Line Welding."

The characteristics of the three classes of resistance welding, butt, spot and line or seam, were briefly outlined, and applications of line welding and line welding equipment developed were described.

It was pointed out that in all types of resistance welding there are characteristics of great value. The heat generated depends chiefly upon the resistance of the current path, the current, the pressure and time. These factors are under control so that after they have once been determined for a particular type of weld, the results can be duplicated with unerring regularity so long as the characteristics of the metal remain the same.

An application of a resistance line welding that resulted in significant savings in connection with the production of sheet steel punchings used in the con-

(Continued on page 1345)

Sparrows Point Wire and Rod Mill

Straight-Line Layout 1525 Ft. Long Provides Continuous Flow of Materials—Rod Mill
Has 17 Stands

BY GEORGE A. RICHARDSON*

PRODUCTION was started a year ago last winter on the new rod and wire mill of the Maryland plant of Bethlehem Steel Co. at Sparrows Point, and the various units have come into operation one by one since. All the essential parts of the plant are now operating.

Located about 10 miles from Baltimore, near the mouth of the Patapsco River, this plant has its own deep-water port, served by its own steamships, and includes its own coke ovens, blast furnaces, open-hearth furnaces, bessemer converters, rolling mills, fabricating, tinning, galvanizing and finishing shops. It receives most of its ores by water from the company's own mines, and limestone from its own quarries.

Starting, therefore, with the raw materials, the plant is entirely self-contained, thus affording opportunity for close supervision of all operations and materials from start to finish. This is the only large steel plant in the United States located at tidewater. As its shipping docks are connected by a 35-ft. channel with the Baltimore-Chesapeake Bay channel, it can ship its products direct by deep-water vessels.

Two additional advantages of location are: (1) The plant is at the rail as well as at the water gateway of the growing industrial district of the South; and (2) it has a large and increasing local market in Baltimore and its environs, advantageously served by motor truck delivery.

Quantity production of rods, wire and wire products demands that the manufacture proceed in orderly sequence, all operations following one another in a simple and direct line. Decreases in excessive handling or travel of materials, substitution of mechanical for manual handling, and up-to-date improvements in all mechanical equipment have a marked effect in improving the efficiency of production.

Recognizing the post-war requirements for economical production, careful engineering on this mill has provided the best known mill layout and construction. Every conceivable condition and emergency has been anticipated and amply provided for. Manual labor has

been reduced to a minimum. Safety features on machines and equipment protect the workmen. Electric power has supplanted steam and has largely eliminated man-power. As far as practicable, individual drives have been installed on machines and units. Spare motor and replacement parts are conveniently available in case of breakdown.

Some features of the rod and wire mill represent new and advanced practice. Hence the description will commence at the reheating furnace, where the billets are heated for rolling into wire rod.

Heating the Billets

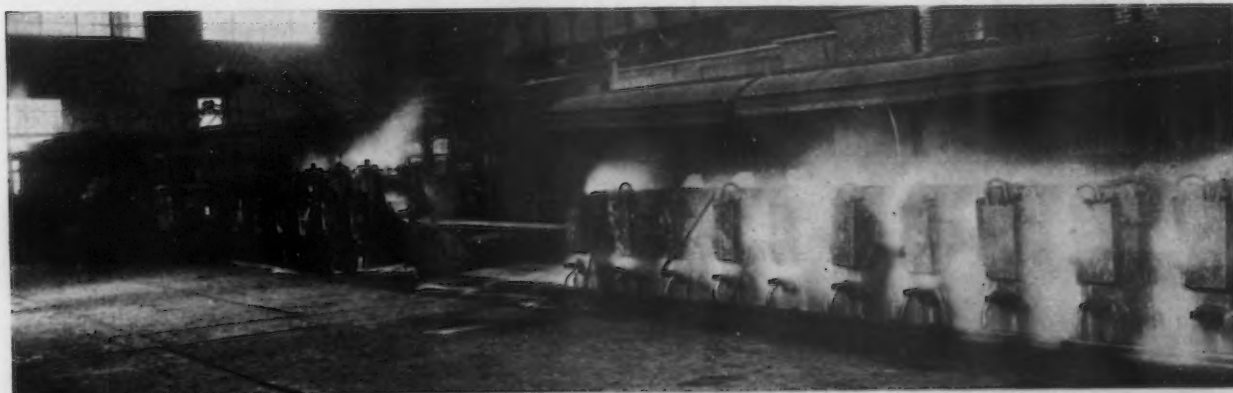
Of the continuous heating, side-discharge type, the recuperative reheating furnace has forced draft. Its heating capacity is 25 tons of 1½-in. square by 30-ft. billets per hour. Billets are charged by electrically operated charger and pusher machine and are discharged directly into the first pass of the roll train by an electric discharging machine. In mills where discharging was performed manually, by means of an iron bar, accidents were not infrequent, and operations were often slowed down or interrupted. The newer method employs a 1½-in. square steel bar with channel guides.

Two 10-ft. diameter gas producers, each with a coal capacity of 2500 lb. per hour, furnish the fuel for the reheating furnace. The producers are automatically charged from overhead storage hoppers, each with a capacity of 26 tons of coal. Coal from a railroad track hopper is dumped by an electrically operated skip-hoist into an overhead chute, which discharges into reciprocating feeders. These feed the coal to electrically operated single-roll crushers, where it is crushed to size and then discharged into the storage hoppers.

Gas from each producer is carried by a 39-in. diameter feeder to the main, which measures 5 ft. 3 in. inside diameter, and thence to the furnace.

Wire Rod Mill

Wire rods are produced in a building with Aiken type roof, structural steel frame and brick walls, with



Hot Billets from the Heating Furnace at Left Enter Immediately the Seven-Stand, Continuous, Roughing Rod Mill. Unusually close setting of the nine intermediate stands and the finishing stand will be noted. The hood over these ten stands carries away the steam from the roll-cooling water

gypsum roof slabs, floors of concrete and steel sash and doors. This building, 350 ft. long by 75 ft. wide and 30 ft. high, has a 15-ton crane of 71-ft. span, which travels its entire length. Here is located the Morgan electrically operated two-high continuous 10-in. wire rod mill of 17 stands, which possesses several outstanding features of technical interest.

This rod mill is different from most others in that it is entirely gear driven. Many roll trains have been driven by means of belts, to insure the smooth flow of power required. Gears had a tendency to "jump" the rolls, causing nicks and bumps on the finished rod. In the present mill, however, this difficulty has been overcome by the use of specially cut helical spiral gears driven by a 4000-hp. 6600-volt slip-ring, induction type General Electric motor. This design eliminates the uncertainty of belt drive and the loss of power due to slippage. Its positive power linkage assures proper relative speeds of each pair of rolls in the continuous trains.

Another difference is the use of 17 stands in place of the usual 16. These consist of seven roughing, nine intermediate and one finishing stand. By the use of the additional roughing stand less work is required in each individual pass. This entails less wear on rolls and bearings, increased ease in retaining the roll draft, and greater production per hour through longer periods of continuous operation and higher speed. The rod mill has forced feed lubrication.

The speed of the first roughing stand is 17.368 r.p.m., or 44.45 ft. per min. Sixty seconds after entering the first roughing rolls, the finished rod emerges from the finishing stand, in which the rolls turn 1195.2 r.p.m., delivering the rod at a speed of 3466 ft. per min.

Coiling Reels and Muffle Conveyors

Four rod delivery or switch pipes and the four coiling reels which they supply are under the control of one man and are electrically operated. Each reel has its own conveyor. When the reel is full, guide pins drop down, permitting the coil of rod to move on to the conveyor without danger of snarling.

All four conveyors are designed to be of the muffle type and are inclined, the point of delivery being well above the floor line of the mill. At present two are being used with the muffles and the other two without. The "muffle" type has proved particularly advantageous in handling high-carbon steels. At the top of the incline, electrically operated tilting arms receive the bundles of rod and transfer them to the hook carrier.

Electrically operated, the hook conveyor is a slowly moving cooling rack, 901 ft. long. The hooks are 4 ft. 3 in. apart and set at such height that the bundles when carried by the hooks, are about 20 in. from the floor. Forty-two minutes are required for the bundles to travel the entire circumference and back to the discharge point, where they arrive at room temperature. Here the bundles, lifted from the hooks, are laid upon the rod trucks in lots of eight bundles to the truck. They are delivered to the shipping platform for loading on railroad cars, or to the rod storage building, whence they are taken to the rod cleaning and baking department.

With storage capacity for 1000 tons of wire rods, the rod storage building has a structural steel frame, with brick walls on concrete foundation, and steel sash and doors. The building, 150 ft. long by 75 ft. wide and 33 ft. high, has an Aiken type roof and a wood block floor on concrete. It is provided with 200 rod buggies. Rods are handled in this house with an overhead crane and a depressed track is provided at one end for loading motor trucks.

Housed in a building 175 ft. long by 100 ft. wide is the rod cleaning and baking department, where the

rods are cleaned, pickled, water coated; or limed and baked, depending upon requirements. Downey type yokes, made of acid resisting bronze, are used for carrying the bundles of rods to the various operations.

Ten wooden pickling tubs, each holding 850 gal. of pickling solution, are arranged in a semi-circle. Acid can be run directly into these tanks from individual acid tanks, which are graduated in gallons. One oval type wooden tub of the same design as the acid tubs is provided, for rinsing the rod after pickling. The two lime tubs are made of steel plate.

A steam-operated jib crane with a boom of 20-ft. radius serves the acid pickling and water rinsing tubs. The hoisting hook of the crane commands the center of each tub. Another similar crane, but with a boom of 14-ft. radius, serves the water rinsing and lime tubs.

Rod that is to be "water-coated" or "rusted" is handled in a rust conveyor 8 ft. wide by 40 ft. long, of the chain type. This conveyor, mounted on a wooden frame, is electrically driven, and has spray nozzles over its entire length. It is built to accommodate the Downey type yokes; a return yoke conveyor returns the empty yokes to the first acid tub for reloading.

Sulphuric acid for pickling is stored in steel tanks, each of 10,000 gal. capacity, located outside the building on steel towers, at about 32 ft. above the general level. The acid flows by gravity from these tanks to the individual tanks in the rod cleaning house. Lime is slaked and stored in two bins, each of 2000 cu. ft. capacity, in a separate brick building.

Baking equipment consists of a 10-track wire rod baker, each track holding eight truck loads of bundles of rod. The baker is divided into five sections, each containing two tracks 62 ft. long. Separate heating by fuel oil or bituminous coal is provided in each section, with unit control for cutting out any one or more of the five sections. Each compartment has a counter-weighted, lifting, sliding door.

At present the bakers are heated with fuel oil, stored in tanks of 30,000 gal. capacity. A fuel oil station equipped with oil circulating pumps, etc., circulates oil not only to the bakers, but also to the pot annealers, lead annealing pans, galvanizing pans, nail bluing hot tumblers, and nail galvanizing hot tumblers.

Wire-Drawing Department

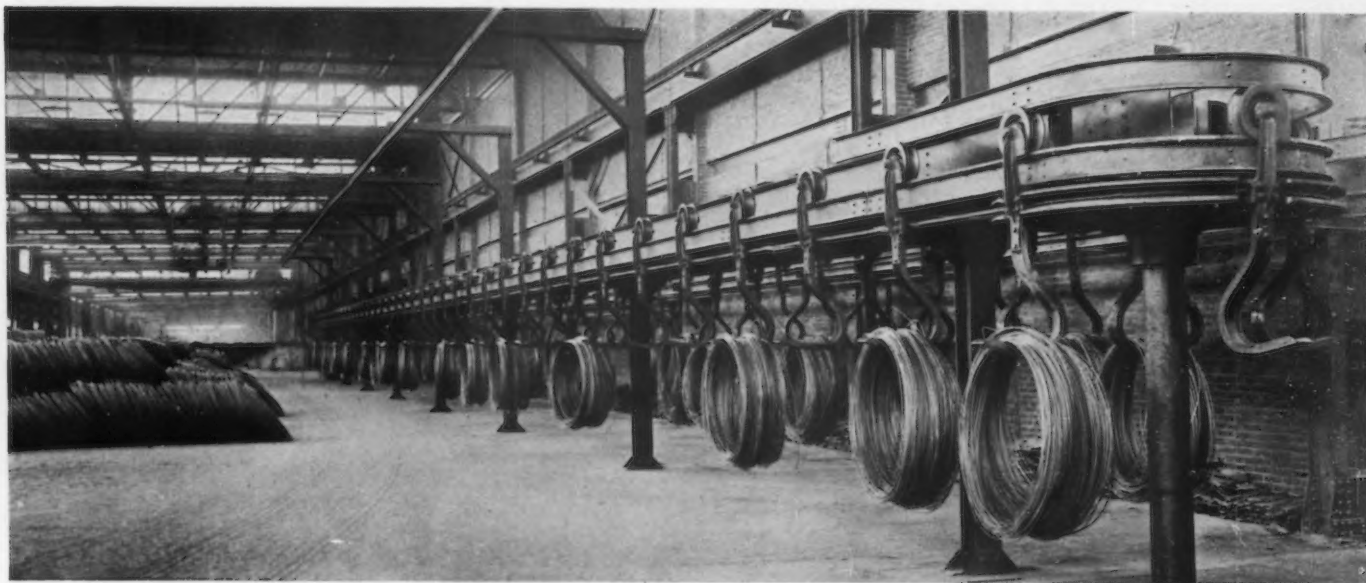
Housed in a building 150 ft. wide by 300 ft. long, the wire-drawing equipment is of the latest type, most of the blocks being single-head, and a few of the double-head type. Each block is driven individually by a 20-hp. d.c. motor, with control gear for any speed between the limits of 50 and 150 r.p.m.

A feature of these wire-drawing blocks is the safety device incorporated in each machine. Located on a corner of the machine, in line with the die, is a metal ring about 8 in. in diameter, supported by an arm, hinged so as to throw backward toward the die block. Connected to this hinged arm is a switch that opens or closes the motor circuit, depending upon its position. In operation, the rod or wire is threaded through this ring, then through a drawing die and on to the drawing block. Should a snarl or kink occur in the rod or wire as it leaves the paying roll, it is intended that it will catch on the ring, throw it back, open the motor circuit and stop the motor, thus preventing accident to the machine or operator*.

To facilitate handling wire coils in passing from one drawing block to another, electrically-operated stripping cranes and hoists are provided. These are controlled by push-button stations carried on the end of downward projecting pipes. Expanding grapples slip down into the center of the wire reels, the grapples are distended and the entire coil stripped from one reel and placed upon the next block in one simple handling. The use of these cranes saves much time and the handling of the bundles is greatly facilitated.

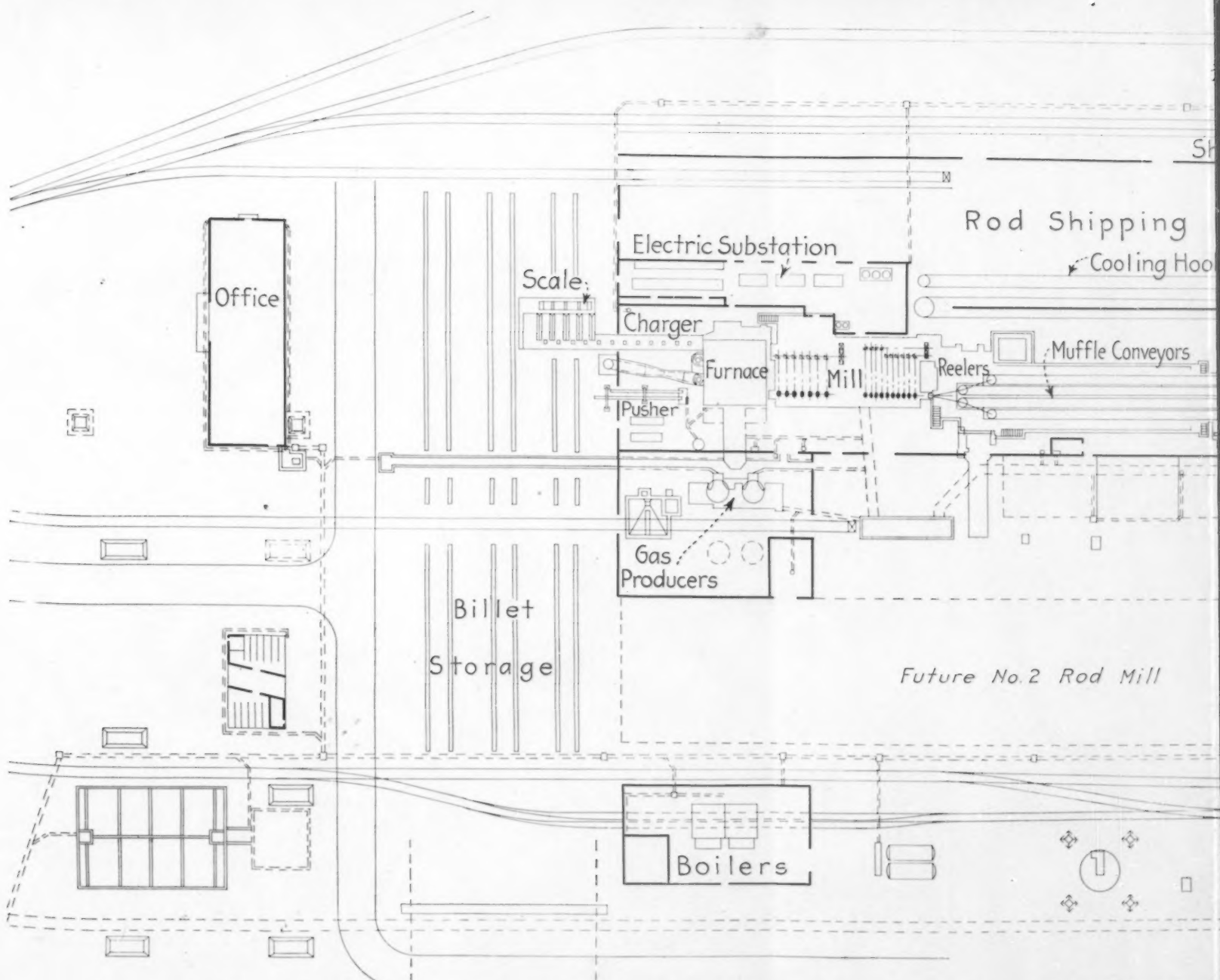
*See THE IRON AGE, June 4, 1925, page 1645, for illustrated description of this safeguarding device.

New Wire Pro



COOLING
Bundles of
Room Temperat
complished on
Conveyor, 901
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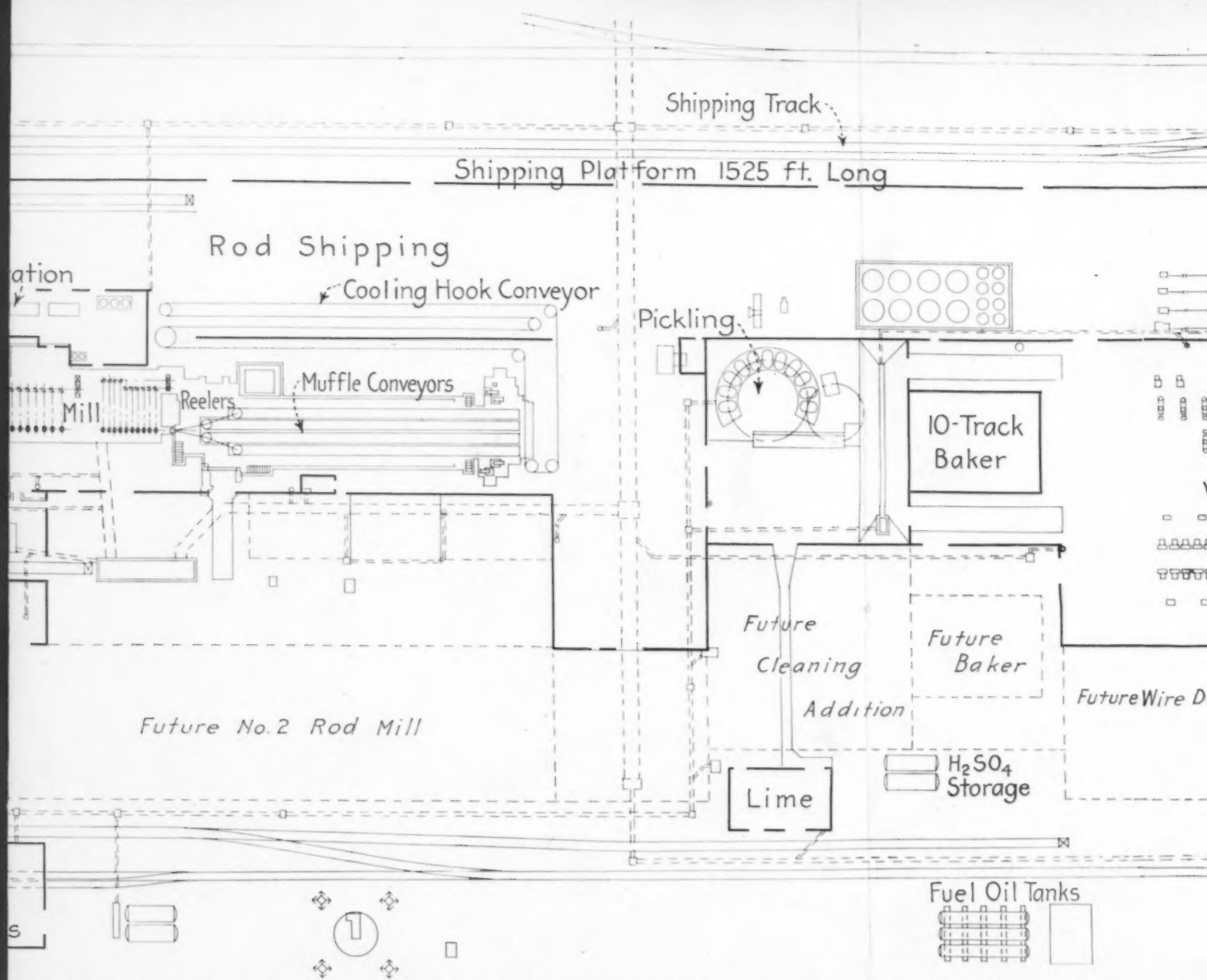
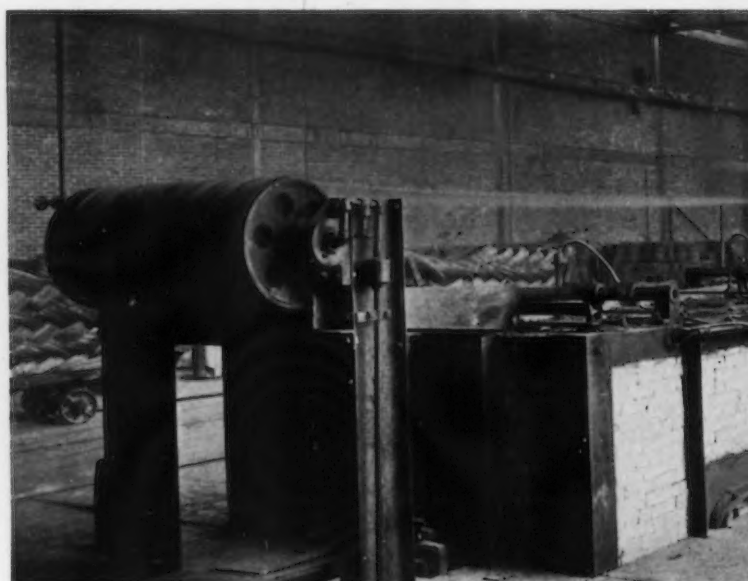
Straight Line Movement of Material, from the Billets Entering the Heating Furnace at the Left to the Barbed Wire D Overall. This Can Accommodate 39 Cars at Once of the Average 39-

New Wire Products and Rod Mill of the Be



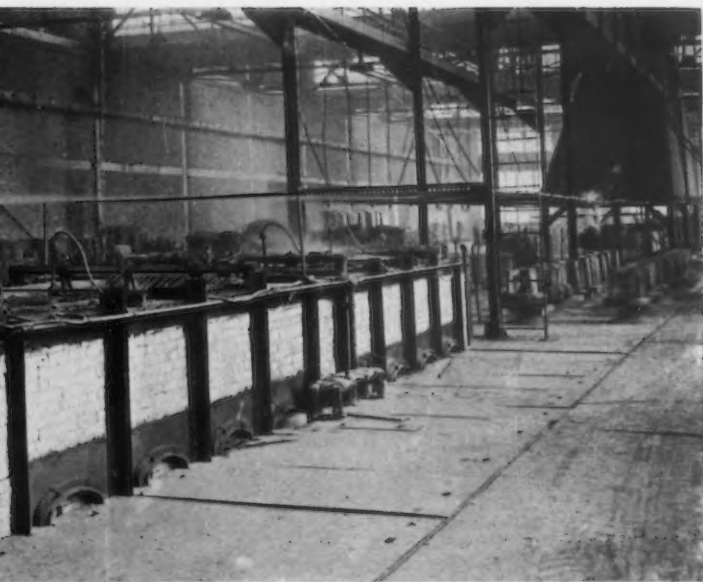
COOLING of the Bundles of Rod to Room Temperature Is Accomplished on This Hook Conveyor, 901 Ft. Long. The circuit is made in 42 min. (Left)

Lead Pans (Right) in the Galvanizing Department Handle 36 Strands of Wire at Once. The wire passes slowly through the bath, control of which is facilitated by pyrometers at frequent intervals

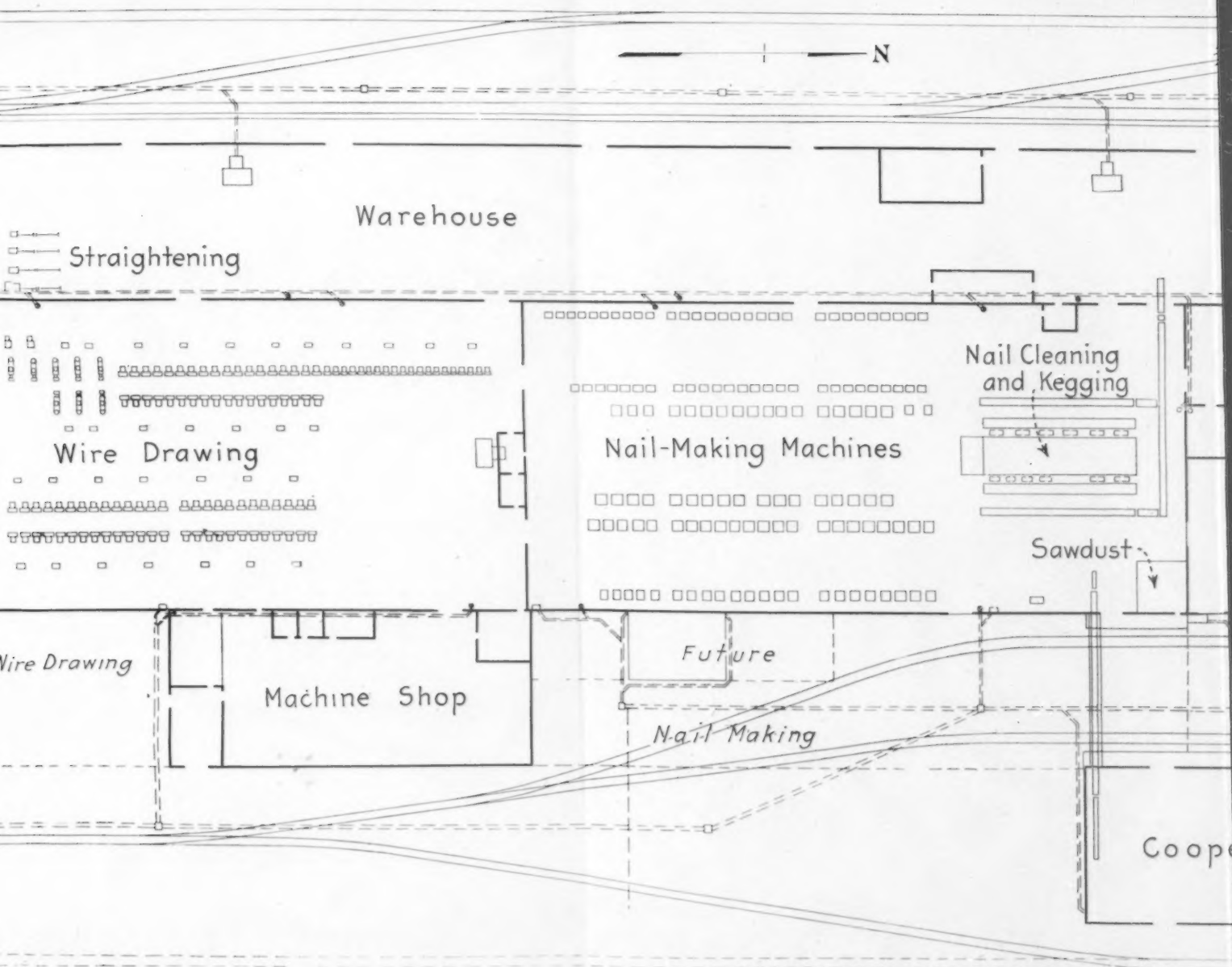
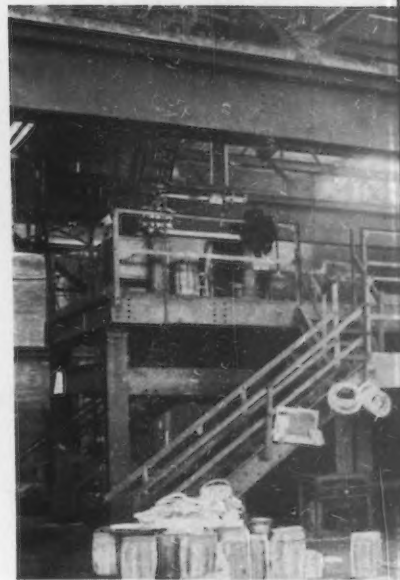


ating Furnace at the Left to the Barbed Wire Department at the Right, Features the Layout of This Wire Plant. Di
accommodate 39 Cars at Once of the Average 39-Ft. Overall Length. Provision for Future Expansion of Many of the

Bethlehem Steel Co. at Sparrows Point, Md.



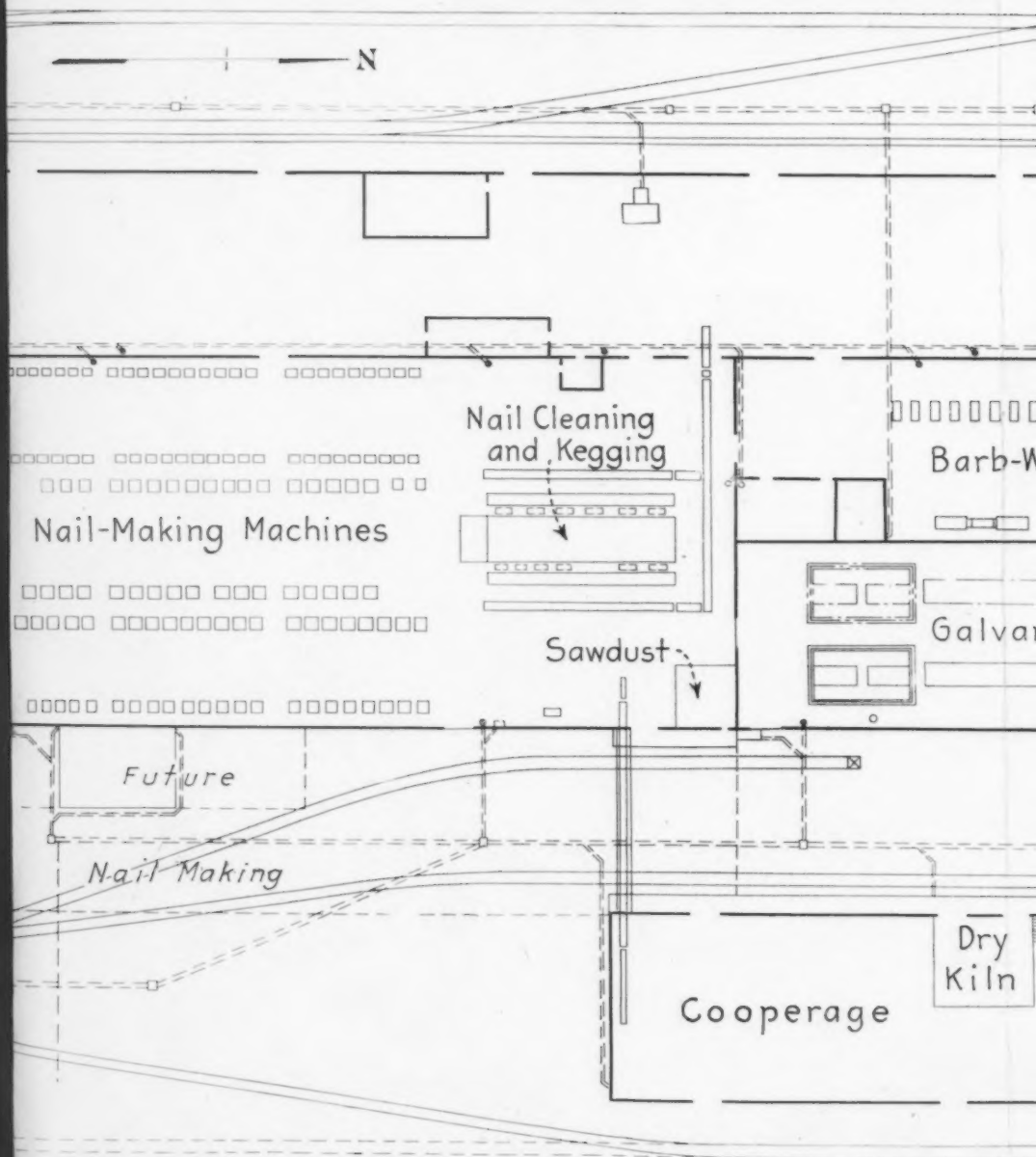
FROM the Nail Machines the Nails Come to the Cleaning Barrels (Shown on Platform at Right). After tumbling, they are run down into the kegs below, located on shakers, and the exact weight in each keg adjusted finally by hand. Sawdust and whiskers are eliminated before the kegs are reached, the whiskers and defective nails going back to open-hearth furnaces for remelting



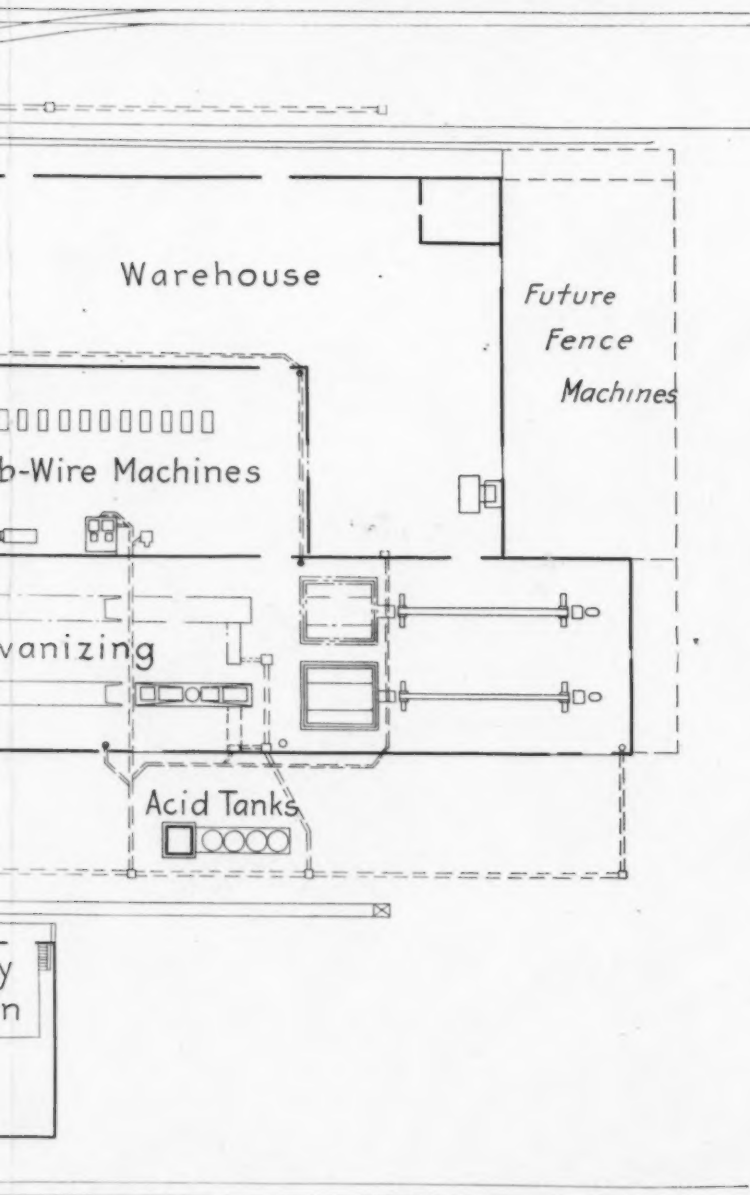
Divisions of Material, at Several Points Along the Way, Take Care of Differences in the Treatment Required. Another of the Departments is Shown. All of This Was Arranged Without Interference with the Cardinal Principle of Straight

Sparrows Point, Md.

FROM the Nail Machines the Nails Come to the Cleaning Barrels (Shown on Platform at Right). After tumbling, they are run down into the kegs below, located on shakers, and the exact weight in each keg adjusted finally by hand. Sawdust and whiskers are eliminated before the kegs are reached, the whiskers and defective nails going back to open-hearth furnaces for remelting



Take Care of Differences in the Treatment Required. Another Feature Is the
Without Interference with the Cardinal Principle of Straight Flow of the Product



The Unusually Long Shipping Platform—1525 Ft.
duct.

Facilities are provided for drawing all sizes of wire, from No. 15 B. & S. to $\frac{3}{8}$ -in. diameter.

Annealing Department

A section of the warehouse and rod shipping department, set aside for the annealing operation, contains fuel-oil fired annealing pot furnaces built to take annealing pots of 36-in. inside diameter and 7 ft. 6 in. deep, each with a capacity of 5000 lb. of wire. Each annealing furnace has two oil burners, one at the top and one at the bottom. These are automatically controlled through pyrometers, insuring a uniform anneal throughout. If the bottom or top of the furnace heats up too fast, the lower or top burner is automatically turned off. Soaking pits also form part of the annealing equipment.

Straightening and cutting is done, in a section of the warehouse, by four electrically-driven wire-straightening and cutting-off machines. The capacities of

of the department. It is 36 ft. wide by 75 ft. long. At the entrance end is a 5-ton platform scale on which incoming nails are weighed.

Beneath the rumbler floor are the nail rumbiers and the keg shakers, driven by electric motors. There are eight 25-keg rumbiers, each with four keg shakers, and four 10-keg capacity rumbiers, each with two keg shakers. The nail rumbiers are elevated, to allow the clean nails to fall from the rumbiers on a steel plate platform, from which the nails are scraped into the empty kegs in the shaking machine.

The kegs are then weighed and enough nails added to the keg by hand to fill to the required weight. From this point the nails go either direct to the shipping room, or to the assorting room to be assorted in preparation for galvanizing, cement-coating or bluing. Six platform scales are provided, three on each side of the rumbler platform.

Serving the nail tumblers are two lines of 18-in.



Take-Up Frames, in the Galvanizing Department, Draw the 36 Wire Strands Through the Baths and Coil Each Wire on a Separate Reel

these machines vary from $\frac{1}{4}$ in. diameter by 20 ft. in length or shorter to $\frac{1}{2}$ in. diameter by 20 ft. in length or shorter.

Nail Manufacturing

The building which houses the nail making department is 150 ft. wide and 325 ft. long and has a wood-block floor laid on concrete. Here are located the various machines and equipment for making the dies, and also for hardening them; an electric furnace being provided for the heating. The layout of the machines in this room is unusually compact, the arrangement permitting a man to turn from one machine to another without walking far.

One hundred and thirty-nine nail machines, adapted to making a wide range of standard sizes and varieties of nails, are installed. Several machines are provided for making standard staples. These are belt-driven, driven in groups from overhead line shafts. Each group shaft is belt-driven from a 50-hp. motor. The capacity of the nail manufacturing department is over 3000 gross tons per month.

Part of the nail manufacturing department, the nail cleaning and keging equipment comprises the rumbler charging floor, rumbiers, various weigh scales, etc. Nails from the nail machines are lifted in buggies to the rumbler charging floor by a 5-ton crane. This floor, of steel, is about 10 ft. 8 in. above the main floor

wide belt conveyors for charging, and two continuous bucket elevators to remove the dirty sawdust and whiskers coming from the tumblers in the cleaning operation. These bucket elevators load the refuse sawdust and whiskers into trucks provided for the purpose, from which they are loaded into railroad cars. The sawdust is separated from the whiskers in a sawdust separator and the latter are then shipped, along with defective nails, to the open-hearth plant for remelting.

A steel storage bin for sawdust, located in the same building, has a capacity of six carloads. It is charged by means of an exhaust fan and suitable piping from the railroad cars.

Two flat apron conveyors 18 in. wide by 75 ft. long and one 18 in. wide by 105 ft. long carry filled kegs to the keg nailing machines and into the warehouse, avoiding handling labor.

All kegs are made in the cooperage plant, adjacent to the nail department. Thence they are carried by an elevator conveyor directly to the packing floor. Five standard sizes of kegs are used, with diameters of $9\frac{1}{2}$ in., $10\frac{1}{4}$ in., $11\frac{1}{4}$ in. and 12 in. The 12-in. kegs are made in two lengths: 18 in. and 20 in. The cooperage shop has machinery for rapidly assembling and completing kegs, its capacity being 50,000 kegs a month. A dry kiln forms part of the equipment.

Nails for cement coating, bluing or galvanizing are



NAIL Making Department, with 139 Machines in Four Lines. All are belt-driven from jack shafts, each group shaft being driven by an electric motor. The nails drop into tote boxes and are carried away on hand wagons to the cleaning and keging station

first carefully sorted, bad or defective nails being thrown out. This assorting is done entirely by girls working at 25 benches in the barbed wire building.

For manufacturing cement-coated nails, a ten-keg tumbler is installed. A hot tumbler and necessary equipment provide facilities for making blued and sterilized nails. Equipment for galvanizing nails includes hot tumbler, water tank, centrifugal dryer, etc.

In the bale tie department, single-loop bale ties are made from Nos. 13 to 16½ wire, in lengths of 7 to 13 ft. Two machines are in use, each of which makes five complete bale ties in one operation or 50 ties per minute. The ties are automatically counted and ejected from the machine in bundles of 250 each. The bundles are then wrapped at both ends with burlap and banded with wire, a metal tag showing the length and gage of the wire being fastened to each bundle. The daily capacity is 8 to 10 tons.

Galvanizing Department

Wire galvanizing is done in another building, 350 ft. long by 75 ft. wide, of the same general type as the buildings already mentioned. The equipment includes two lead pan annealing furnaces, complete with depressor rolls and comb. These pans are 54 in. wide by 15 ft. long and 10 in. deep, and arranged for annealing 36 wires at one time. The furnace, 40 ft. long, is arranged for oil or coal fuel. One galvanizing pan, complete with depressor rolls and wipers, is 54 in. wide by 24 ft. long and 22 in. deep, and is arranged for galvanizing 36 wires at one time. The furnace is 26 ft. long and arranged for oil or coal fuel. A water quenching box is used for cooling wires before they enter the granite pickling tank.

There are also one granite pickling tank; one water wire-washing box to wash acid off wire before it enters the one granite flux box; one inclined hot-wire drying



EXPANDING-Arm Grapple Hooks are Used to Remove a Coil of Drawn Wire from Its Block. Control buttons (shown at lower end of pendant pipe just in front of the grapple in action) are used. The ring at each block is a safety device, stopping the block at the first impact of a kink

plate to dry wire before it enters the galvanizing tank; one inclined coke wipe, to wipe surplus spelter from each strand of wire as it leaves the galvanizing tank, and one 36-reel, electrically operated take-up frame, 18 reels in each side, the gearing and motor drive of which are designed to run at nine different speeds.

With this equipment wire from No. 16 gage down to No. 4 gage can be galvanized. There is enough space to install another unit of like capacity.

Muriatic acid storage equipment consists of four 2500-gal. wooden, rubber-lined tanks. An electric motor-driven duriron pump and necessary piping are located in a brick pump house, arranged to transfer acid from tank cars into the storage tanks and to pump

from its length, is the roof which extends out over the middle of the cars and protects the entire platform, precluding weather interference with the loaders and their work.

Auxiliary features of the wire mill include a machine shop in a building 75 ft. wide by 175 ft. long. This houses a full equipment of machine tools required for making current repairs for all plant equipment.

Large Increase in Steel Furniture

Shipments of steel furniture in March, at \$3,080,931, made the largest monthly total in several years, according to Department of Commerce figures. The



OPEN and Muffle - Type Bundle Conveyors, in Four Parallel Strands, Take the Rod Coils from the Reels as Fast as They are Completed. It is the intention to use Muffles, eventually, on all four lines of conveyors

from them into a rubber-lined measuring tank in the wire galvanizing room.

Equipment at Sparrows Point can do the heavier galvanizing required by telephone and railroad specifications. These include the so-called "4-min." tests.

Barbed wire is made in a building 75 ft. wide by 225 ft. long, of the same general construction as the other buildings. Here are located machines for making four-point Glidden, four-point Invincible, four-point Cactus, four-point Conemaugh, two-point Glidden and other combinations. The machines are arranged in a group and driven from a line shaft through quarter-turn leather belts. The line shaft is driven by a 50-hp. electric motor at a speed of 250 r.p.m.

Shipping Warehouse and Platform

Shipping facilities are important factors in the expeditious handling of material. Those provided at Sparrows Point are exceptionally good. Facilities for the bulk shipment of rods, wire and wire products are provided by a shipping room and finished stock warehouse 1525 ft. long by 75 ft. wide, with a storage capacity for 1800 tons of rod and with 900,000 cu. ft. of space for wire products.

The shipping platform, 12 ft. wide, is also 1525 ft. long, and affords ample room for all shipping requirements. An outstanding feature of this platform, aside

gain from February was nearly 15 per cent. In March, 1926, the total was \$2,843,869, while in March, 1925, it was \$2,253,005. New orders in March, at \$3,021,915, exceeded those for any month of the past two or three years, except for January, 1926, when the excess over the current figure was about 1.4 per cent. Unfilled orders at the end of March aggregated \$1,743,968, a decline of 3 per cent from the total at the end of February, but otherwise the largest amount in 11 months.

First quarter shipments aggregated \$8,498,064, an increase of 2.4 per cent over the first quarter of 1926 and a gain of nearly 30 per cent over the first quarter of 1925. New orders in the first quarter exceeded shipments by about \$180,000.

Steel shelving shipments in March were \$690,783. This is the largest total since that of April, 1926. It is considerably lower, however, than that of March, 1926, when \$726,413 of shelving was shipped. New orders are running a little ahead of shipments. Unfilled orders at the end of March aggregated \$678,531, the largest total since November.

What is said to be a world's record in changing the main hoist cable on a 125-ton ladle crane is reported by the Wheeling Steel Corporation, Steubenville, Ohio. This change was made in 2½ hr. James Farrington is superintendent of the electrical department and J. P. Griggs is open-hearth superintendent.



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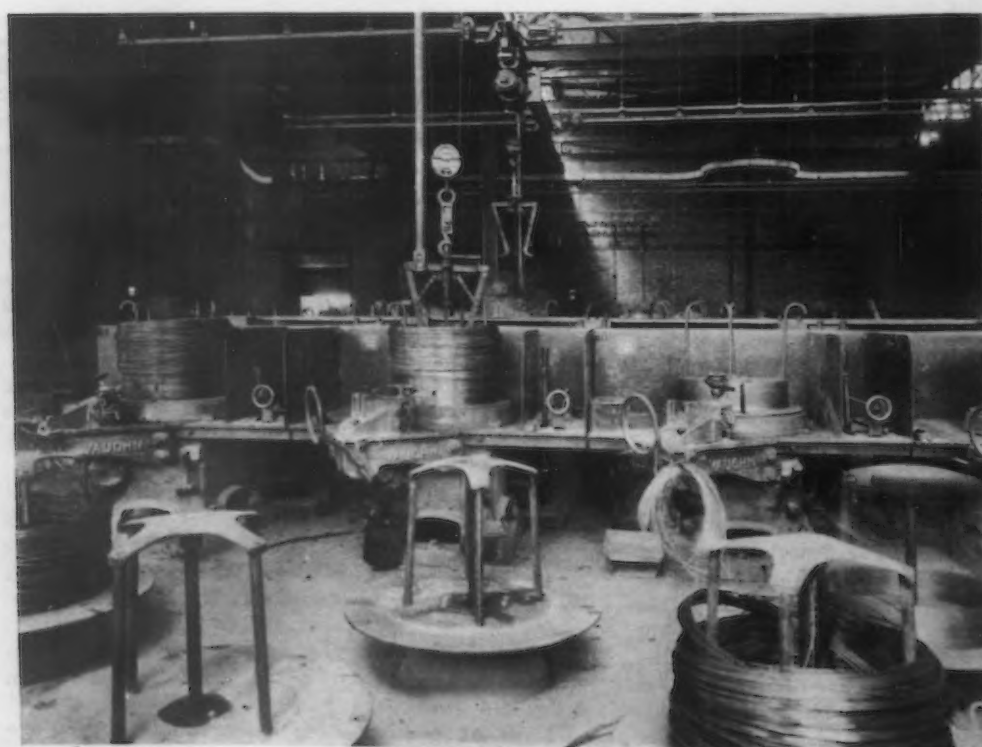
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Historic Iron Making Property, Active

*Robesonia Furnace at Robesonia, Pa., Together With
Bethlehem Steel Co., Which Will*

TYPICAL of the changes which have come about in the merchant pig iron situation in recent years, resulting in the shutting down or scrapping of many merchant blast furnaces since the World War, is the passing of the Robesonia furnace at Robesonia, Pa., on whose property pig iron has been made almost continuously since 1793. The furnace, together with its rights in perpetuity to ore from the Cornwall ore banks near Lebanon, Pa., has been sold to the Bethlehem Steel Co. for a reported consideration of \$1,000,000. The furnace will no longer be operated, but the transaction gives the Bethlehem Steel Co. complete ownership of the Cornwall mines, which have an estimated reserve of about 60,000,000 tons of magnetite ore of 42 or 43 per cent iron content.

The Robesonia furnace had been put out of blast prior to its transfer to the Bethlehem Steel Co., and, according to the announcement of the purchaser, "probably will be dismantled as commercial conditions have made it increasingly difficult to operate an isolated unit of that character."

William Penn, when governor-general of the district now called Pennsylvania, ceded to the Grubb family a tract of land which contains the now famous Cornwall ore banks. Upon the death of the senior Grubb this property was divided among his children and Peter

Grubb, the younger, came into possession of a one-sixth interest. May 9, 1786, Peter Grubb conveyed to an employee, Robert Coleman, this interest with the proviso that there should be reserved "the right, liberty and privilege at all times hereafter of digging, raising and hauling away a sufficient quantity of iron ore for the supply of any one furnace at the election of Peter Grubb, Jr., his heirs and assigns, at all times hereafter." This proviso eventually became the subject of bitter litigation which kept the courts of Pennsylvania occupied for many years.

Peter Grubb, Jr., never exercised the right to take ore from the Cornwall banks, but on May 1, 1788, sold his rights to George Ege, who built what was known as the Reading furnace, a small charcoal stack, situated near the town which later became known as Robesonia. The old wall of the original charcoal stack still constitutes a portion of the boiler platform of the present Robesonia furnace.

Pig Iron First Made in 1793

The first pig iron made by George Ege in his Reading furnace came on the market in October, 1793. Then, and during the entire intervening period, the iron made on the property was from ore brought from the Cornwall banks, 25 miles away. It was originally brought



Since 1793, Passes Into Discard

*Its Rights in Perpetuity to Cornwall Ore, Sold to the
Not Operate the Stack Again*

down from the hills in carts and subsequently by railroad transportation.

During the period between Mr. Ege's death in 1835 and the year 1844 the property passed through various hands, among the owners being Messrs. Klein, Seilzinger, McCrea, Porter and others. In 1845 Robeson, Brooke & Co. purchased the property, and the town of Robesonia derived its name from Mr. Robeson. This firm immediately erected a larger furnace, using anthracite coal as fuel, and hot blast stoves were employed for the first time. In 1854 this stack was dismantled and another was erected, again of increased capacity. In the records of the Robesonia Iron Co. it is stated that the first stack of Robeson, Brooke & Co. was capable of producing 40 to 50 tons of iron a week and the one erected in 1854 had a capacity of 250 tons a week.

Robert Coleman and George Dawson Coleman, descendants of the original Robert Coleman to whom Peter Grubb, Jr., had sold his one-sixth interest in the Cornwall ore banks, brought suit against Robeson, Brooke & Co. following the erection of their 50-ton-per-week stack in 1845, alleging that they were taking from the Cornwall mines a greater amount of ore than the title of reservation had intended. The litigation which followed lasted for nearly 20 years, and the tes-

timony introduced in various court hearings presented a great deal of interesting information regarding the early manufacture of pig iron both with charcoal and anthracite coal. The history of iron making in this country and in England was thoroughly reviewed at that time.

Ore Rights Confirmed by Courts

The Supreme Court of Pennsylvania finally rendered a decision fully supporting the claims of the defendants, who were then the successors of Robeson, Brooke & Co., all of the original plaintiffs and defendants having died prior to the completion of the litigation. The Supreme Court held, among other things, that the reservation gave to the furnace owners "the right to as much ore as will supply any one furnace to be selected by them, and that right to select is not exhausted by its successors at a single instance;" and further, that "the owners of the ore right . . . are not restricted to the quantity of ore used by Mr. Ege at the time he elected the Reading furnace; but that they have a right to a sufficient quantity of iron ore to supply any one furnace from time to time to be selected by them, although of larger capacity than the Reading furnace elected by Mr. Ege, and using anthracite as fuel, the hot blast and other modern improvements in the manu-



Cornwall Ore
Banks Which
Bethlehem Steel
Co. Now Owns
in Entirety

facture of iron not known and in use at the time of the election of the Reading furnace."

Robeson, Brooke & Co. operated the anthracite furnace built in 1854 until 1858, when upon the death of Mr. Brooke the firm became Robeson & White, Mr. White being the son-in-law of Mr. Brooke. This firm was in existence only one year. In 1860, following the death of Mr. Robeson, the firm of White, Ferguson & Co. was formed, the name later being changed to White & Ferguson and subsequently to Ferguson, White & Co. Upon the death of the elder Mr. White, William R. White, a son, and his sister, Mrs. H. P. Borie, purchased Mr. Ferguson's interest in the property, and with William C. Freeman and Edward C. Freeman and their sisters, Miss Isabel C. Freeman and Mrs. B. H. Buckingham, formed the Robeson Iron Co. on April 1, 1885.

New Furnace Built in 1914

Upon taking possession of the property the Robeson Iron Co. erected a new and greatly improved furnace, this stack remaining in service until 1914, when it was replaced by a larger, hand-filled furnace. An automatic skip top was supplied in 1921 and the furnace property was otherwise brought up to date. The furnace plant as it stands today, while of moderate capacity, is modern in design and equipment.

The charcoal iron made at Robeson between 1793 and 1845 was used principally in the forges of that day. With the development of the Bessemer process in years subsequent to 1845 the anthracite iron and afterward the coke iron made at Robeson, being of low phosphorus quality, was employed very largely for the manufacture of Bessemer steel, largely rail steel. The iron was shipped in quantities which were large

for that period to steel mills at Scranton, Steelton, Chester and elsewhere, and not infrequently moved to the Pittsburgh district. In later years, following the supersession of the open-hearth process of making steel, the iron made at Robeson, being sufficiently low in phosphorus for the manufacture of steel castings by the acid open-hearth process and baby Bessemer process, has been largely sold for that purpose.

Ownership Stays Long Time in One Family

Upon the death in 1914 of William R. White, then chairman of the Robeson Iron Co., his interest became vested in his sister, Mrs. M. Clementine Borie of Philadelphia, who in June, 1922, sold her entire share to Miss Isabel C. Freeman and her sister, Mrs. B. H. Buckingham, and their nephew, William C. Freeman, who has been president of the Robeson Iron Co. from that time until its transfer to the Bethlehem Steel Co. Through the fact that it has so long been owned entirely by one family the Robeson furnace probably is unique among the blast furnace plants of the country. Another record achieved by this furnace is that for length and continuity of operations it is probable that its iron making activities have not been exceeded by any other blast furnace in the United States.

It is also worthy of note that William C. Freeman, who has been president of the Robeson Iron Co., is a descendant of the first Robert Coleman, to whom Peter Grubb, Jr., sold his interest in the Cornwall ore banks. Three generations of the Lea family in Philadelphia have sold Robeson pig iron to the trade. Robert C. Lea of the firm of that name, who has held the selling agency for 24 years, was preceded in that capacity by his father and his grandfather.

Manufacture of High-Pressure Boiler Drums

Welding of Longitudinal Seams $3\frac{1}{2}$ -In. Thick and Upsetting of Ends to Close in the Head—Methods of European Shops

RAPID adoption of extra-high pressures in steam plants and for important chemical processes has developed an entirely new boiler shop practice, especially among the German firms. Continental engineers seem to have fixed 600 lb. per sq. in. pressure as the limit for riveted drums; beyond that figure leakage is a factor which cannot be ignored. To meet the demand, Krupp has forged more than 300 drums from solid ingots, for working at pressures up to 2000 lb. per sq. in. The Thyssen firm has been very successful in making equivalent apparatus by forge-welding; the largest of such drums requiring longitudinal joints in metal $3\frac{1}{2}$ in. thick.

A description of the Thyssen process is given in *Engineer* for March 4. It states that the firm has been making corrugated furnaces (for marine boilers), steam domes, and penstocks by forge-welding since 1894. During the war it constructed about 800 hydrogen drums, each 50 ft. long, by 3 ft. diameter to carry 1420 lb. per sq. in. pressure.

Welding by a Plain Lap

For a long time it was thought that the maximum thickness which could be welded with a plain lap was $1\frac{1}{4}$ in. Thicker plates were joined by welding a separate wedge-shaped piece of metal into the joint. This difficulty was solved in 1921, when the present forge-welding plant was built. Total costs are said to be approximately two-thirds that of forging from the ingot.

Plates finishing up to 14 ft. wide, 53 ft. long and 18 tons weight can be handled. After shearing, the metal exhibits stress lines (when etched by Fry's reagent) some 6 in. into the plate. To remove any deleterious effect, the plate is then annealed at 900 to 920 deg. C. (1650 to 1690 deg. Fahr.), and cooled in the oven. All annealing is done in a gas-fired oven, with flat temperature gradient and under careful pyrometric control.

Forge Welding Is the Method Used

Edges to be welded are then planed to form a scarf joint, and the plate is cold-rolled to the correct curvature. The maximum plate which can be bent is $3\frac{1}{2}$ in. thick; these rolls have a 31-ft. opening.

Forge-welding is done in the usual way by heating a short region from both above and below to the welding heat by water-gas flames, and then closing the joint with a pneumatic hammer.

After welding, the cylinder is again annealed at 900 deg. C., and taken hot to the bending rolls, where it is given an exact cylindrical shape. It runs idly in the machine until cold enough to prevent warping. The ends are then machined and a preliminary hydraulic test of $1\frac{1}{2}$ times working pressure is imposed.

Closing Ends and Testing

To close the ends, each end is then heated, separately, and the metal upset by curved dies in a vertical press in such a manner that the end assumes a hemispherical shape, with a comparatively small control opening for manhole. The head is thickened very considerably toward the center, thus putting extra metal where it is needed.

Final testing is by hydraulic pressure and is carried up to and slightly beyond the elastic limit. The elastic behavior of the drum while under test is measured by steel tapes at various circumferences, and by tram points at the heads. Test pressures may be carried as high as 5000 lb. per sq. in.

Stressing past the elastic limit not only insures a sound drum but one which has a perfect shape. Finally the drum is reannealed, to remove all strains due to heading and testing. An exhaustive metallographical study of a completed drum was presented by C. Wallmann, a director of Thyssen, to an association of pressure vessel owners (Vereinigung der Grosskesselbesitzer E. V., at Kiel; September, 1924).

Finds Industrial Outlook Bright

National Metal Trades Association Examines Shop Problems and Broad Economic Subjects with Optimism for Future

BESIDES dealing intensively with such definite shop problems as employee pension plans and foremanship training, the National Metal Trades Association, at its twenty-ninth annual convention held at the Statler Hotel, Detroit, on April 26, followed the usual custom of discussing such broad economic subjects as anti-trust legislation, industrial preparedness, the future problems and prospects of business and the place of industry in modern political and spiritual life. With an attendance of 300, a substantial increase over last year's registration, and a series of sectional and secretarial meetings extending from April 25 to 27, the convention was characterized by a spirit of optimism for the future of the metals industry and a desire to give the worker as well as the employer the full benefit of the industry's progress.

Business Conditions Declared Favorable

BUSINESS conditions, industrial disputes, foremanship training and pension plans were among the topics touched on in the address of Paul T. Norton, president of the association, which opened the meeting. Unusually favorable was the report on business conditions included in the address, which was, in part, as follows:

"Of 442 replies to our current questionnaire on business conditions, 46 per cent state that business is good or excellent. Forty-three per cent state that business is fair, and 10 per cent state that business is poor. The first question asked was, 'How is business?' Thirty-three replied 'excellent'; 173 replied 'good'; 191 replied 'fair,' and 45 replied 'poor.'

"The second question was, 'How does it compare with six months ago?' One hundred and twenty-nine replied 'better'; 177 replied 'about the same,' and 133 replied 'not as good.'

"The second part of the question concerned a comparison with conditions a year ago. On this question 135 replied 'better'; 151 replied 'about the same,' while 128 replied 'not so good.'

"The third question was, 'What is the outlook for the next six months?' to which 21 replied 'excellent'; 175 replied 'good'; 169 replied 'fair,' and only 11 replied 'poor.'

"As to available labor, 292 reported no shortage of any kind of labor, 65 reported a scarcity of skilled tool and die makers, 25 reported a scarcity of all-around skilled machinists, while 37 reported a scarcity of miscellaneous skilled craftsmen. . . .

Membership Increases

"I am glad to be able to report a membership of 1025 firms, at the close of the fiscal year, an increase of 23 members over a year ago. The total number of operatives reported by the new members exceeds the total number reported by those lost to the association by 9518. . . .

First Association Course in Foremanship

"For more than eight years our organization has taken an active part in the promotion of industrial education. This department, under the guidance of our committee on industrial education, of which John Spence of the Norton Co. of Worcester is chairman, is concerned primarily with current problems incident to apprenticeship and foreman training. . . .

"Due to an increased appreciation of the need for better foremanship, and to the lack of suitable text material for conducting foremanship conferences, this committee was advised to prepare what they considered to be a suitable course for foremen employed in the metal trades. The first half of this course was recently completed and made available to the member-

ship. . . . The outstanding feature of our course is that it represents the first effort on the part of a group of employers to formulate a definite training program for employees in a given field.

"This course, in its composite form, consists of an introduction booklet containing information for management on the general subject of foreman training and on the use of this particular course. Fifty-two lessons form the body of the course, and a leader's manual provides data for presenting the course under local leadership. . . .

Anti-Trust Legislation a Check on Labor

"The year 1926 witnessed the usual disturbances in the building trades and other unionized industries, and in the course of that year a total of 551 industrial disputes were referred to the United States Department of Labor for conciliation. . . .

"Just how satisfactory labor conditions are in our member plants may be judged from the statement that no strikes occurred during 1925; that during 1926 only one disturbance took place which affected three of our members, and that in the past five years a total of only nine strikes is recorded. . . .

"The strike which occurred during the past year was in New York in the shops of our members manufacturing chandeliers, and was a part of a general strike involving this industry in that city. The disturbance occurred in connection with the efforts of the New York unions to organize the shops of chandelier makers. . . .

"The chandelier case in a large way becomes vital to employers generally when it is considered as an effort on the part of organized labor to use its domination in one industry to compel the unionization of other industries. If, through restrictive practices, boycotts and strikes on the part of the strongly organized building trades industry, manufacturers of materials for building trades, can be intimidated and coerced into meeting the demands of labor organizations, efforts similar to the chandelier case become a matter of deep concern to our association, other open shop organizations, and society as a whole.

"The tactics pursued by the unions in conducting the chandelier case closely parallel tactics employed in conducting the Danbury Hatters' case and the Duplex Printing Press case, both of which have been held to violate the Sherman anti-trust law; although there is possibly a slight change in practice to evade prosecution under that act. The fact remains, however, that anti-trust laws seriously hamper the effectiveness of labor unions' coercive machinery, and it is not to be wondered at that union labor is so anxious to witness the repeal of the Sherman anti-trust law and similar acts. Some businessmen feel that the Sherman anti-

trust act has unduly interfered with their legitimate activities. I do not intend to discuss that proposition, but, instead, would direct your attention to the fact

that the repeal of the anti-trust laws would remove one of the instruments that now protects our employers against the intimidations of organized labor."

Sees Danger in Government Pension Legislation

FOLLOWING the reports of the committees on membership, industrial education, prevention of industrial accidents and on industrial relations which were essentially elaborations of topics as covered in President Norton's address, the meeting was given over to a discussion of pension plans. A liberal abstract of the committee report on this subject was published in *THE IRON AGE* last week, but a new light was thrown on the subject by E. G. Plowman, industrial relations adviser, Associated Industries of Massachusetts, in a paper entitled "Employee Retirement Plans."

Pension Plans an Economic Necessity

Mr. Plowman stated that, until recent years, employee retirement had existed in industry as a hobby of employers rather than a definite company policy. The adoption of government old age pension plans in 17 countries and the establishment of similar systems in four States in this country, however, have brought the matter to the immediate attention of industry.

The speaker pointed out that under the force of public opinion it had become necessary to provide a living for the individual who has become too old to work or been deprived of the ability to make a living by some other means. Although the idea is essentially socialistic in nature, it is not generally looked upon from that standpoint, and has merely come about through the changing point of view of modern society.

Three Types of Pension Plans

"There are in existence in the United States at this time," Mr. Plowman said, "three ways for the workman to have this living, which the world seems to owe him in old age, provided. The first is the individual saving plan by which the workman sets aside a part of his earnings each year for the provision of old age. This plan is entirely the problem of the individual and industry has no part to play, except the possible maintenance of savings banks which encourage the laying aside of money.

"The second type is the gift plan under which the superannuated employee is taken care of by voluntary gifts on the part of the employer. The third method is the payroll deduction type by which certain sums of money are regularly taken from the wages of the worker and set aside to provide for his old age."

Worker Must Be Forced to Demand Rights

Basing his convictions upon the supposition that people must now have their bill of rights forced upon them if they are to get their just dues in life, Mr. Plowman made a strong plea for the third or compulsory type of pension plan. "Unless industry takes the

leadership in this matter," he said, "the State will." The gift type will inevitably bring about this state or social control, according to the speaker, and we shall have a form of socialism or State controlled industry which is contrary to the present ideals of American business. Mr. Plowman ended his talk with that challenge to industry. Either it must take the lead in compulsory pension plans with small costs and inestimable benefits to itself or the State will step in and introduce a form of pensions which may be totally inapplicable to many industries.

The session was brought to a close by a paper on "Installing, Administering and Financing Retirement Plans," by W. E. Odom, director department of industrial relations, National Metal Trades Association, which was an admirable summation of the work of the association committee as mentioned above.

Training of Foremen

THE essential points in the conference method of training foremen were brought out by C. F. Klinefelter, Federal Board for Industrial Education, Washington, who was the first speaker on the subject of foremanship. He stated that the Federal Board was a consulting rather than a directing or teaching body, and that its chief function was to stimulate thinking based upon experience in foremanship. One of the best methods used in the discussion groups, Mr. Klinefelter pointed out, is urging the men to enumerate their various functions and thus get the reactions of others as to the best ways of performing these functions. In summarizing, the speaker urged the teaching of foremen to utilize the faculty for which they have been made foremen, that is, versatility in handling all types of work in their departments.

G. Heding, factory manager, Morkrum-Kleinschmidt Corporation, Chicago, told of the success of his company in the operation of a plan of foremanship training instituted by the association.

Albert Sobey, director General Motors Institute of Technology, Flint, Mich., outlined the plan of foreman training in practice at that institution, pointing out the need for trained foremen in the automotive industry at the present time.

Interpreting Anti-Trust Legislation

Because of its importance as an interpretation of the controversy between business and government on the subject of anti-trust legislation, a paper entitled, "Individualism, the Ideal of American Business," which was presented by Federal Trade Commissioner Abram F. Myers, will be dealt with separately in *THE IRON AGE* with more liberal abstract than might be presented here.

Calls Business Cycles Unnecessary

THAT the business cycle theory is the worst bogey confronting American industry today was one of the many important points brought out in a talk on "The Prospects, Problems and Puzzles of Business," by Virgil Jordan, chief economist National Industrial Conference Board, Inc., New York. "All cycles," Mr. Jordan said, "must be man made. One reason for them is an excess of individualism; another is plain ignorance. We watch business very closely when it does not prosper, but pay no attention to it when it runs well. Consequently the reason for cycles."

Prospects for 1928

Discussing the possibilities of a depression in 1928, Mr. Jordan said that there were no reasons why such a business slump needed to occur. He pointed out that the size of the national income had increased 30 per cent since 1922 and that it should not stop increasing. The prices of basic commodities such as steel are not

high and are on the decline as a result of over-production. The general price level, however, the speaker asserted, is not on the decline.

Mentioning some unfavorable conditions, Mr. Jordan stated that the percentage of our exports to total production has not been increased for many years. "Europe," he said, "cannot increase her buying power under present conditions, and present foreign investments have not been made wisely in all cases. Loans to industry would have been more profitable to the country at large than loans to governments."

Automotive Industry Is Key to Prosperity

Seeking a reason for the present unusual prosperity of the country as a whole, Mr. Jordan said, "European observers say that nearly all Americans ride in automobiles and consequently seem to be prosperous. What they really should say is that Americans are prosperous because they ride in automobiles. The auto-

motive industry is the greatest factor in the country's prosperity today.

"The constant development of new industries is the reason for American economic success," he said. "Busi-

ness cannot stand still and be prosperous. Naturally it cannot move backward, and consequently the only way to maintain present conditions is to seek constantly to improve them."

Preserving Peace by Preparing for War

AFTER showing briefly the enormous consumption of munitions in a modern war and the paralyzing effect of a shortage thereof on the fighting power of an army. Brig. Gen. Colden L.H. Ruggles, assistant chief of ordnance, United States Army, took up the subject of national industrial mobilization, explaining in considerable detail the steps which have been taken to allocate the manufacture of war materials to various industrial plants in case of a national emergency. The subject was considered most recently in *THE IRON AGE* on March 10, 1927, page 730, but General Ruggles brought out a number of points which bear more than a passing interest.

Shell Forging from Seamless Tubing

"In connection with the problem of manufacturing shell forgings," the speaker said, "the National Tube Co. suggested to the Pittsburgh district ordnance office that shell might be made successfully from seamless drawn steel tubing. After a study of this proposed method, orders were placed for the manufacture of test lots of 75 mm. and 155 mm. shell.

"Briefly the operations performed consisted of making the usual 22 ft. lengths of tube of the proper diameter and wall thickness. These tubes were cut to length and one end closed in to form the base of the shell. This left a slag inclosure in the center of the base which was eliminated by drilling a $\frac{5}{8}$ in. hole and inserting a screw plug. The shells were then pointed at the front end under a hammer in the usual manner. Up to this point the operations were performed by the National Tube Co., and subsequent operations were performed at our arsenals. By this process the weight of metal to be removed in machining is greatly reduced, and shells may easily be machined on standard machines."

General Ruggles pointed out that further studies are being conducted to determine the possibility of making all sizes of shell up to and including 240 mm. shell from tubing and that investigations are also being made to determine whether it is more practical and economical for the tubing manufacturers to close the base and front end of the shell or simply to furnish machining contractors with tubing cut to proper length, requiring the latter to perform all subsequent operations.

Drawing Shells from Steel Disks

"The Boston district ordnance office," General Ruggles went on to say, "proposed a method of manu-

facturing shells from plate by which circular steel disks are punched, cupped and drawn on crank presses and the blanks then placed on a mandrel and swaged very nearly to finished dimensions on a centrifugal swaging machine of a type manufactured by the Langelier Co., Providence, R. I. The pointing in of the front end is also done on the swaging machine. It is anticipated that this machine will turn out work of sufficient accuracy to permit the shell to be ground immediately to the finished dimensions in centerless grinders, thus eliminating part of the machining. Further work will be necessary to determine definitely the practicability of this method."

The speaker explained that the capacity of American steel mills for producing seamless steel tubing is so great that the government has utter confidence in its ability to fill war time emergencies.

Producing Gun Bodies by Centrifugal Casting Process

After touching briefly on the plans of the government for securing adequate supplies of such materials as smokeless powder, trinitrotoluol, ammonium nitrate and nitrogen, General Ruggles discussed the plan now being carried out at the Watertown Arsenal in the production of gun bodies by the centrifugal casting process. "The method," he said, "consists of pouring the molten steel into a refractory lined mold of approximately the finished size and shape of the gun while this mold is being rotated at a high speed. The rotation brings considerable pressure on the molten metal, rendering it sound when cooled and driving the non-metallic impurities to the center where they may be removed by reasonably heavy boring operations."

"Another promising method of quick and economical production of gun bodies," he continued, "which is now being investigated, is the use of drawn steel seamless tubes of commercial sizes which can now be obtained with physical characteristics that will meet our needs. Depending on the size of the gun, one tube alone may be used, or two or more tubes nested one within the other, after they have been finished to reasonably accurate internal and external diameter."

Cold Working of Cannon

Adoption of a new method for the construction of guns not exceeding 6 in. in diameter of bore, which has many advantages over the older and more costly process was described at some detail by General

Officers of National Metal Trades Association

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Paul T. Norton, president Case Crane & Kilbourn Jacobs Co., Columbus, Ohio

First Vice-President

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E. C. Heidrich, Jr., president Peoria Cordage Co., Peoria, Ill.

W. Ledyard Mitchell, vice-president Chrysler Motor Car Co., Detroit

E. A. Muller, president King Machine Tool Co., Cincinnati

Edwin P. Root, president New Haven Clock Co., New Haven, Conn.

J. A. Sheldon, general manager Willys Overland Co., Toledo

Ralph E. Thompson, vice-president Gillette Safety Razor Co., Boston

Councilors Whose Terms Expire Next Year

Paul C. De Wolf, vice-president Brown & Sharpe Mfg. Co., Providence, R. I.

J. A. Horn, vice-president Yale & Towne Mfg. Co., Stamford, Conn.

Robert Biddle, president Biddle-Gaumer Co., Philadelphia

C. C. Gibson, president Mullins Body Corporation, Salem, Ohio

M. E. Forbes, president Pierce-Arrow Motor Car Co., Buffalo

P. H. W. Smith, vice-president Standard Underground Cable Co., Perth Amboy, N. J.

The late William Goodman, vice-president Worthington Pump & Machinery Corporation, New York, had been selected by the nominating committee for second vice-president of the organization, and the position was left vacant until a later date.

Ruggles. "Some years ago," he said, "it was proposed in this country to do away with the necessity of shrinking one part of a gun over another, and to put the initial strains desired in the gun body by subjecting a gun body of a single piece construction to an interior hydraulic pressure sufficient to cause a permanent enlargement of the bore of several per cent. The result of such treatment is to stretch each successive layer of metal from the bore to the outer surface beyond its elastic limits, but to a regularly decreasing amount. When the internal pressure is removed each successive layer tends to return to its original condition, as modified by the permanent set introduced into the material.

"Since, however, the permanent set is greatest at the bore, the outer layers are prevented from returning to a neutral state. This puts the inner layers in a state of compression which diminishes gradually from the bore to a point in the wall of the gun body where the metal is left in a state of tension which increases gradually to a maximum at the outer surface. The result is that the solid gun body is placed in the same ideal condition to resist an interior pressure as would be a gun made of a great number of cylinders shrunk one over the other with the shrinkage determined by calculation using the regular gun formulas."

The advantages of this method of construction, as outlined by General Ruggles, are that machine work is radically reduced compared with former methods, that

each gun is pre-tested during manufacture to a pressure two to three times greater than that to which it will be subjected when fired, and that a lower grade of steel can be used, if desired, because the metal of the gun is given a high elastic limit by the cold working to which it has been subjected.

An Answer to the Capitalistic Problem

Choosing as his subject, "The Place of Industry in Modern Life," Congressman Charles A. Eaton of New Jersey at the banquet on Tuesday evening outlined the American plan of solving the problem of capitalism by the creation of more capitalists. Characterizing industry as the instrument which modern civilization has chosen for its advancement, he compared what he chose to call the Russian idea of using this instrument and the American idea.

"The American worker," he said, "has added to his innate productive capacity by the use of power and proper machinery and management 30 times the productive capacity of the Chinese worker and a greater capacity than is enjoyed by the workers of any other civilized nation. With this unseen capacity he obtains an increasing surplus, making it possible for him to become a buyer of all sorts of commodities and thus a capitalist in the truest sense." The preservation and growth of this sort of capitalism was characterized by Mr. Eaton as the ultimate goal of American industry.

Upholds Freight Charges on Steel Moved Without Permit Under an Embargo

WASHINGTON, May 3.—Claiming there is no merit to the contention that when the shipments are allowed to move to embargoed destinations they are subject under the tariff to the joint rates to such destinations, the Interstate Commerce Commission in a decision handed down last week upheld freight charges on steel in carloads from Johnstown, Duquesne and Beaver Falls, Pa., Canton and Youngstown, Ohio, and Buffalo to Providence, R. I., and Watuppa, Mass., and ordered dismissal of a complaint by the Congdon & Carpenter Co., Providence. The shipments moved in 1923, at a time when the New York, New Haven & Hartford Railroad had embargoed freight, with certain exceptions not including steel, unless moved under a permit from connections by stated routes. The decision said the complainant was aware of the embargo and had no permits covering the steel shipments but, anticipating that it might later procure permits or by other means effect movement to final destinations, it billed to Worcester, Mass., over the Boston & Albany Railroad, five cars intended for Providence, and to New Haven, Conn., eight cars intended for Providence and one intended for Watuppa, but had to pay demurrage charges which had accrued.

Commissioner Johnston B. Campbell dissented. He declared that actually or constructively the superintendent of transportation of the New Haven gave his permission for the movements. The New Haven rendered no additional service, he said, except that which the reconsigning fee is designed to cover, "yet it is here seeking to justify a weak, vacillating method of handling traffic, which will result under the decision of the majority in approximately doubling its revenues on the cars here considered."

Commissioner Campbell evidently looked with apprehension to the precedent that may be established by the majority opinion in injuring shippers, adding:

Obviously, it is calamitous for a manufacturer to have his supplies cut off. Therefore, loose or ununiform methods of enforcing embargoes open the door to flagrant discriminations even though intentional favoritism is not practised. If the carriers may procure financial gain by failing to adhere closely to their embargoes, it is clear that they are not likely to be over-concerned about it. The decision of the majority invites such a practice, while the opposite effect would result from a finding that the charges assailed were illegal to the extent that they exceeded those which would have accrued at the rates from points of origin to points of final destination.

tions in effect on the dates of shipment, plus the applicable diversion or reconsignment charges. To my mind such a finding should be made in this case and reparation awarded to complainant.

New Company to Operate Chain of Water Terminals on Great Lakes

The Terminals & Transportation Corporation of America, controlled by New York and Detroit interests, announces plans for a \$20,000,000 development based on further coordination of the rail and water transportation systems of the Great Lakes through a chain of modern storage and distribution terminals in the strategic industrial centers of this area. Detroit, Buffalo, Chicago and Duluth, Minn., will be linked immediately through terminals controlled by this corporation.

The Detroit Railway & Harbor Terminals Co., the McDougall-Duluth Terminal Warehouse Co. and the Minnesota-Atlantic Transit Co., owned by the parent corporation are now in operation. At the outer harbor of Buffalo the corporation will erect a terminal with 2250 ft. of dock and 3,520,000 cu. ft. of storage. These facilities will not be completed until next year, but the water transportation service of the corporation will operate into Buffalo this year, utilizing existing railroad docks. The Chicago terminal is in the Calumet Harbor district and will be the first large modern terminal to serve that section. The corporation has purchased enough property to provide later adequate storage capacity to meet growing demands.

The Minnesota-Atlantic Transit Co. will maintain its established service between Duluth and Port Huron, Mich., while the expanded water transportation service of the parent corporation will link all terminals and serve all large ports. Also all cities on the New York State barge canal will be served by special motor ships operating between Detroit and New York. Upon completion, the corporation's terminals will have a physical value of \$17,000,000, more than 18,000,000 cu. ft. of space and docks with a capacity of an interchange of 2,000,000 tons of freight per year between rail and water carriers.

Management will remain in the executive officers of the consolidated companies. Main offices will be in Detroit, with branch offices in New York, Buffalo, Duluth, Chicago, Minneapolis and St. Paul, Minn.

Rates Called Discriminatory

Manufacturers' Association and Civic Bodies in Michigan

Protest Steel Rates at Detroit—Buffalo and Cincinnati Also Object to Existing Scales

FURTHER concerted objection to freight rates on iron and steel products throughout Official Classification territory and added support to the contention of many producing and consuming districts that some sort of a mileage scale is the only thing that would bring anything approaching equalization were the features of the third general hearing of the iron and steel rate inquiry conducted by Commissioner Johnston B. Campbell of the Interstate Commerce Commission, which was held at the Statler Hotel, Detroit, April 25 to 27. Even though another definite scale for rate fixing was introduced into the testimony and aroused some interest on account of its carefully studied historical basis, objections to the present system and to the Jones & Laughlin scale, rather than actual constructive suggestions, formed the principal business of the sessions.

A feature of the hearing was the almost complete representation of manufacturing cities in the lower peninsula of Michigan, whose testimony was unanimous in declaring freight rates in that territory under the present zoning system to be higher than corresponding rates in Ohio and Indiana, and consequently prejudicial to Michigan industry.

John L. Lovett, general manager of the Michigan Manufacturers' Association, led off the testimony with a mass of figures showing the importance of Michigan as a consumer of iron and steel products. He asserted that the railroads had never taken into consideration the rapid and recent development from an agricultural to an industrial region of the lower peninsula of Michigan, and showed that approximately one-thirteenth of the country's output of iron and steel in 1926 was consumed in that territory. J. C. Graham, chairman of the iron and steel committee of the manufacturers' association and traffic counsel of the Jackson Chamber of Commerce, testified along the same lines and emphasized the unfairness of fifth-class rates in that State as compared with commodity rates on similar products in other districts.

C. B. Teft, traffic commissioner Lansing Chamber of Commerce, produced exhibits showing the high earnings last year of railroads operating almost entirely within Zone B in Michigan as compared with earnings of carriers operating in other districts of Central Freight Association territory. He introduced a table showing comparative rates and distances from points in steel producing centers to points in Zone B of Michigan and to other points in C. F. A. territory. Thus, from Youngstown, Ohio, to Lansing, a distance of 280.3 miles, the freight rate is 29c., while from Youngstown to Muncie, Ind., a distance of 286 miles, the rate is only 24.5c. Mr. Teft also pointed out the diversity of Lansing's industry and presented a table showing the city's consumption of various iron and steel products during the first half of 1926. This total, exclusive of steel used by the Motor Wheel Corporation, itself a large consumer, amounted to almost 57,000 tons, nearly half of which was bars. An interesting point made in the cross-examination was that most of this tonnage came from the Pittsburgh and Youngstown districts in spite of the alleged discriminatory freight rates.

Says Rates Impede Detroit's Growth

L. G. Macomber, traffic manager Detroit Chamber of Commerce, made a strong plea for commodity rates on iron and steel products shipped into and out of the city, and insisted that any scheme placing Detroit on an equal mileage basis with Cleveland and Pittsburgh would be satisfactory. He stated that Detroit

industry could not continue to grow and prosper with the present "ruinous" rates on freight, and sought a scrapping of the so-called Jones & Laughlin scale and the introduction of a more equitable mileage basis for fixing rates.

Jackson's position was brought out by J. J. Lynch, Hayes Wheel Co., of that city, and L. W. Price, of the chamber of commerce, who pointed out discriminations against their city which favored Indiana and Ohio points. The fence industry was represented by P. L. Carter, Jackson Fence Co., Jackson, who said that freight rates had brought financial difficulty to eight of ten fence manufacturers in that part of Michigan during the last ten years. He stated that Michigan fence manufacturers labor under a freight rate handicap of 4½c. to 5½c. per 100 lb., and said that even intrastate rates are unnecessarily high when compared with corresponding rates in other States.

Albion, Kalamazoo, Pontiac, Battle Creek, Saginaw, Bay City, Port Huron, Benton Harbor, Muskegon, Holland and Howell all had representatives at the hearing, whose testimony unanimously protested the existing rate zoning in Michigan as it applies to foundries, machinery makers, castings makers and all branches of the metals industry operating in the lower peninsula of the State. Further testimony on behalf of Lansing was offered by H. C. McGovern and C. C. Carlton, of the Motor Wheel Corporation, the largest single consumer of steel in that city.

Points Out Buffalo's Disadvantages

The difficulties of meeting foreign competition on the Atlantic seaboard, on account of high freight costs and Buffalo's unfavorable rates on coal and coke as compared with low rates on iron ore to Pittsburgh, were pointed out by William H. Donner, president Donner Steel Co., Buffalo. He said that foreign steel reaches Atlantic Coast cities by means of water shipment \$4 a ton cheaper than it can be shipped from Buffalo, Pittsburgh or Youngstown, a condition which is proving more injurious each year to the American steel industry. He also pointed out the importance of Buffalo as a steel producing center, but said the local market was not nearly large enough to take up this tonnage. Emphasizing the low earnings of the steel business, he held that equalized freight rates would allow the industry to compete on more favorable terms outside of its own individual districts and bring about a healthier condition generally.

Emphasizing the advantageous natural economic conditions which Buffalo enjoyed, Mr. Donner said that high rates on coal and coke from western Pennsylvania had practically offset the low water rates on iron ore from which the city was able to benefit, while the Pittsburgh district, situated in the midst of the coal fields, also was given the advantage of low freight rates on iron ore from the Lake Erie docks. Such high rates on coal, together with unfavorable costs in the transporting of finished steel products, the witness observed, had given Buffalo a handicap under which it could not possibly operate profitably. J. P. Daly, traffic manager for the Donner company, supplemented Mr. Donner's testimony with a series of traffic arguments which sought to prove that the Jones & Laughlin scale is contrary to the Government's usual liberal attitude toward industry.

Proposes New Scale of Freight Rates

A mileage scale based on a fixed terminal charge of 6c. for the first 5 miles, and providing for a rate of progression of ½c. for each additional 5 miles up

to 90 miles, of $\frac{1}{2}$ c. for each additional 10 miles from 90 to 180 miles, of $\frac{1}{2}$ c. for each additional 15 miles from 180 to 270 miles, etc., was presented by E. E. Williamson, testifying in behalf of the Andrews Steel Co., the Newport Rolling Mill Co. and the Globe Iron Roofing & Corrugating Co., all of Newport, Ky. Although south of the Ohio River, Newport is included in Official Classification territory.

Mr. Williamson went back into the history of rate making to obtain the fixed terminal charge of 6c. upon which to base his scale. He stated that under a ruling of 1879 the freight rate from New York to Chicago had been fixed at 25c., of which 6c. had been set aside for fixed charges for origin and delivery at terminals. This percentage, Mr. Williamson said, had been used as a factor in rate fixing ever since, but under the so-called Jones & Laughlin scale, the freight rate from Pittsburgh to Chicago, of 34c., included $13\frac{1}{2}$ c. in terminal charges, an exorbitant amount. Under the Williamson scale the Pittsburgh-Chicago rate would be reduced to $26\frac{1}{2}$ c. He also sought to prove that the density of traffic over a road should not influence the making of rates, citing the comparative earnings per mile of track on certain lines to clinch the point. He

then contended that the adoption of his scale would not bring about a reduction in earnings of the carriers, but in some cases would result in increases.

Mr. Williamson next pointed out the discriminatory condition which exists in rates from Newport to St. Louis and points in Indiana and Illinois as compared with rates from the Chicago district to similar points. Chicago, he said, enjoyed commodity rates to these points, while Cincinnati and vicinity were forced to pay full fifth-class rates.

He pointed out that his scale provided the same rate of progression as the so-called Brown scale introduced at the Columbus hearing, but that he felt the arbitrary base rate suggested in the latter scale, it being the rate of $9\frac{1}{2}$ c. from Cleveland to Youngstown, was too low. Deducting $6\frac{1}{2}$ c. for line-haul charges for that distance, the witness stated that the 3c. left for terminal charges would not allow a reasonable profit. Mr. Williamson defended his plan under vigorous cross-examination by railroad representatives, and expressed a belief that the carriers would be able to withstand a rate reduction of as much as 10 per cent without seriously disturbing their revenues.

Another hearing will be held in Chicago May 12.

PIG IRON RATE REVISION

Reconstruction of Rate Structure in Central West Ordered by Commission

WASHINGTON, May 3.—Reconstruction of the pig iron rate structure between points in Central territory, entailing both increases and reductions, effective May 30, was ordered by the Interstate Commerce Commission in a decision given out last week. The opinion brings to a conclusion contention over rates on pig iron in this important producing and consuming section that existed since 1923, and changes a relationship that prevailed for 35 years or longer. Opposition developed not only among railroads, producers and consumers, but also among State commissions. The rates finally determined upon are in the nature of a compromise and are those finally prepared as a broad revision of the entire rate structure by the railroads. The carriers state that the rates are approximately 10 per cent lower than those in effect on July 1, 1922, and about 82 per cent higher than the rates in effect in 1913. Among the principal producing points included in the revision are Cleveland, Toledo, Dover, Ironton, Lorain, Middletown, Columbus, and Jackson, Ohio; Detroit; Ashland and Newport, Ky.; Chicago and Granite City, Ill., and the various points in the Mahoning and Shenango Valleys, comprising Youngstown, Girard, Leetonia, Struthers, Lowellville, and Warren, Ohio, and Sharon, Sharpsville, and New Castle, Pa.

The table, stated in rates per gross ton, is a typical presentation of the present and proposed rates. The rates preserve the origin and destination groups that have existed for many years. Distance is given much consideration in the adjustment, and competitive conditions and existing relationships are the controlling factors, according to the commission.

While finding the proposed rates justified generally, the decision stated exceptions and ordered canceled

schedules pertaining to the latter. They included a rate of \$2.15 per ton from the Chicago district to St. Joseph, Benton Harbor and Bridgman, Mich.; a rate of \$2.40 from the Chicago district to Goshen, North Manchester, Huntington and Wabash, Ind., and a rate of \$2.90 from Toledo to Logansport, Ind.

It was stated that the rates on pig iron between points in Central territory are not constructed upon any scientific basis. They have been established from time to time, it was declared, to keep pace with the growth of the pig iron industry.

"With few exceptions the carriers, producers, and consumers upheld the propriety of maintaining rates on pig iron with primary regard for commercial and competitive conditions, and contend that satisfactory relationships between the respective shipping points is more important than the level of the rates," said the decision. "The great majority of protestants are opposed to the application of any distance scale and expressed their belief that pig iron rates in Central territory could not be adjusted satisfactorily upon either a strictly distance basis or a fixed percentage of sixth class. The only producer who advocated a distance scale stated that such a scale would be disastrous to his own company if it had to market a surplus production of pig iron from one of its plants. It is admitted by some protestants that under the proposed rates respondents' revenues on this commodity will be approximately 10.2 per cent less than under the rates effective July 1, 1922."

Rates on Fabricated Tank Steel Declared Unreasonable

WASHINGTON, May 3.—Passing upon a number of complaints by steel makers and oil interests, the Interstate Commerce Commission in a decision made public on Friday of last week held that rates on fabricated iron and steel tank material in carloads from points in Pennsylvania, Ohio, Illinois, Indiana, and from Kansas City, Kan., to destinations in Kansas, Oklahoma, and Texas are unreasonable to the extent that they exceed rates on iron and steel pipe. Indicative of the general situation are the rates on tank material and pipe from Pittsburgh. The present rate on tank material from Pittsburgh to Cushing, Okla., and Texas common points is \$1.02 per 100 lb., while the pipe rate to Cushing is 88.5c. and to Texas common points it is 89c. The commission also awarded reparation and set Aug. 10 as the effective date for the new rates.

Officers of the Danville Structural Steel Co., expansion of which concern was noted on page 1116 of our April 14 issue, include C. S. Wagner as president and H. W. Bay as vice-president and general manager; C. A. Weymouth, vice-president; J. N. Pursel, treasurer, and M. E. Clover, secretary.

Present and Proposed Rates on Pig Iron in Central Territory

To	From							
	Youngstown	Cleveland	Toledo	Chicago	Youngstown	Cleveland	Toledo	Chicago
	Pres-	Pro-	Pres-	Pro-	Pres-	Pro-	Pres-	Pro-
	ent	posed	ent	posed	ent	posed	ent	posed
Benton Harbor, Mich.	\$4.79	\$4.20	\$3.53	\$3.90	\$2.90	\$2.90	\$1.89	\$2.15
Grand Rapids, Mich.	4.79	4.20	4.41	3.90	2.90	2.90	3.02	3.00
Dowagiac, Mich.	4.41	4.54	3.28	3.75	2.90	2.90	2.65	2.25
Coldwater, Mich.	4.54	3.45	4.10	3.15	2.02	2.00	3.02	3.00
Lafayette, Ind.	4.79	4.20	3.53	3.90	3.15	2.90	2.65	2.40
Logansport, Ind.	4.54	3.70	3.28	3.40	2.65	2.90	2.65	2.40
Mishawaka, Ind.	4.54	3.70	3.28	3.40	2.65	2.65	1.89	2.05
Goshen, Ind.	4.16	3.55	3.15	3.25	2.50	2.50	2.27	2.40

PATENT OFFICE APPEALS

New Procedure Shortens and Simplifies Matter—Old Method in Force Since 1861

WASHINGTON, May 2.—Important simplification of Patent Office procedure with resulting benefits to American industry and trade was instituted today when the reorganized Board of Patent Appeals was established, as provided by an act of the last Congress, so as to function as the single patent appellate tribunal of the Patent Office, replacing the dual method of appeal formerly practised. Commissioner of Patents Thomas E. Robertson said the new appellate system has the hearty indorsement of the American bar and industry. A letter from a leading member of the New York bar said "the bill reorganizing appeals in the Patent Office will effect the greatest improvement ever made in its practice."

The new board, made up of the commissioner, two assistant commissioners and six examiners-in-chief, will eliminate approximately one-half of the time formerly required in appeals. It will thereby reduce to that extent the congestion of cases in the Patent Office. Three members will constitute a quorum of the board.

Replaces Procedure 66 Years Old

On March 2, 1861, two days before the inauguration of President Lincoln, President Buchanan signed an act providing for a board of examiners-in-chief in the Patent Office to hear appeals. For 66 years that body has functioned in hearing appeals from rejections of applications by examiners and in deciding priority of invention between two or more conflicting inventors. On March 2, 1927, exactly 66 years after the official establishment of this board, President Coolidge affixed his signature to the bill creating the reorganized Board of Appeals.

Previously, the original appeal from office rejections was heard by the Board of Appeals, from whose decision appeal could be had to the Commissioner of Patents. From the commissioner's decision, appellate jurisdiction was vested in the Court of Appeals of the District of Columbia. Under the reorganized plan it is designed that the single appellate tribunal will always include the commissioner or one of his assistants, sitting with two of the examiners-in-chief. Appeals from this body will, however, still be heard by the District Court of Appeals.

The two appellate bodies formerly existing in the Patent Office necessitated two pleadings of the case, two decisions and double preparation for the hearings. Moreover, a period of one year could elapse between the appeals. This procedure has now been virtually cut in half, while another salient feature of the new act reduces to six months the period of time within which the appeal must be made. Approximately 6000 appeals are handled each year by the Patent Office.

Scrap Rates Not Applicable on Steel Products Shipped in Original Form

WASHINGTON, May 3.—Bearing directly on a question now before the railroads, scrap dealers and steel makers, the Interstate Commerce Commission, in a decision made public last week, held again that to come within the scrap classification and take the scrap rate steel products may not be shipped in their original form but must be reduced to fragments, scraps or pieces so as to render them useless for any purpose other than remelting.

"It is the nature of the article shipped, not the price at which it is sold, the use to which it is put or the commercial demand, that determines whether the rate on scrap iron and steel applies," said the decision, which cited previous opinions it had rendered on this issue.

The case immediately concerned was that of the Hyman-Michaels Co., Chicago, against the Norfolk & Western and other railroads. The complaining company, a scrap dealer, contended that rates charged on carload shipments of iron and steel articles moved between March 30 and Oct. 24, 1923, from Norfolk and

Port Norfolk, Va., to Newark, N. J., and McKees Rocks, Pa., were unreasonable, unduly prejudicial and inapplicable. The articles consisted of Government surplus material used in ship construction which was a part of a stock on hand at Navy yards after the World War. Specifically the products were rivets, grab rods, handles, stanchion heads, davits, hooks, pads and pad eyes, heads, rings, levers, bars, bolts, etc. At the hearing it was agreed to limit the issues to the question whether the shipments lawfully came within the tariff description of "scraps and pieces of iron and steel which have value solely for remelting purposes" and therefore subject to commodity rates on scrap iron and steel sought by the complainant. The commission held that the rates charged on the products as new material and not as scrap were applicable. It said the evidence showed that the articles were transported in their original form, described by the names of the individual articles.

Railroad Holds Welding Meetings

Under the direction of J. G. Morgan, director of personnel, supervisory officials of the Delaware, Lackawanna & Western Railroad attended a meeting at Scranton, April 12, at which new developments in welding were discussed. O. P. Lang, welding engineer, Lincoln Electric Co., in charge of the Philadelphia office, presented motion pictures and slides to illustrate the subject.

The new manufacturing method in which the equivalent of a casting is made by welding together pieces of steel proved of interest. Similar meetings are planned for Buffalo, Syracuse and other points on the line of the railroad.

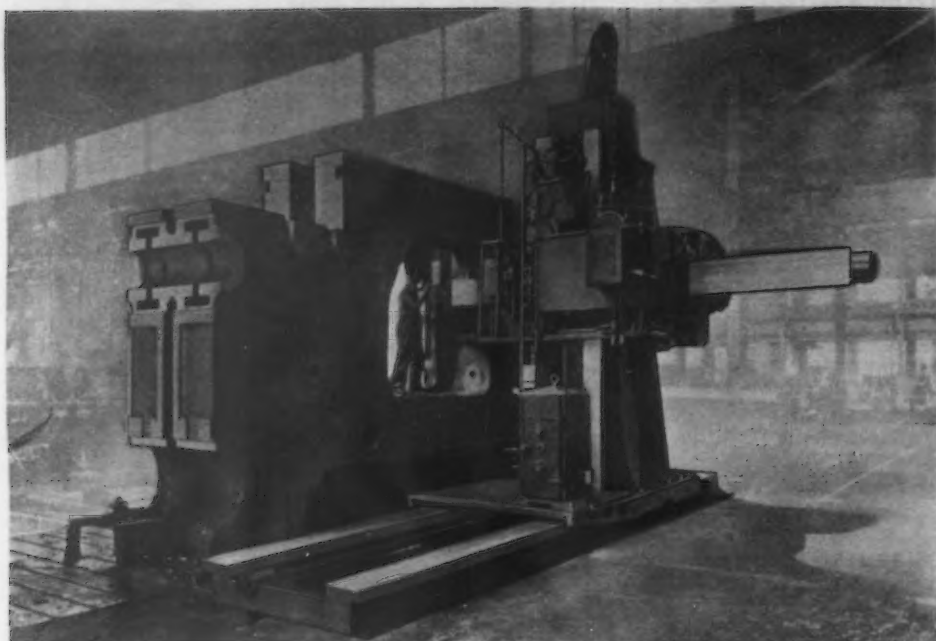
Arch Machinery Co. Completes Organization

The organization has been completed of the Arch Machinery Co., which took over, as of May 1, the machine tool business of the Pittsburgh office of Manning, Maxwell & Moore, Inc. Norman Alderdice is president and treasurer of the new company, and Thomas M. Rees, Harry W. Cross and John R. Hussey are vice-presidents, the last-named also being secretary. These men constitute the former personnel of the Pittsburgh office of Manning, Maxwell & Moore, and the new company also retains all of the agencies of the old company for western Pennsylvania, including Altoona, West Virginia, Maryland and eastern Ohio.

The exclusive accounts are those of the Cone Automatic Machine Co., Windsor, Vt.; Putnam Machine Co., Fitchburg, Mass.; Amplex Mfg. Co., New York; National Machinery Co., Tiffin, Ohio; Bausch Machine Tool Co., Springfield, Mass.; the Detrick & Harvey Machine Co., Fitchburg, Mass.; Defiance Machine Co., Defiance, Ohio; Beaman & Smith, Fitchburg, Mass.; W. F. & John Barnes Co., Rockford, Ill.; Dreses Machine Tool Co., Cincinnati; Charles G. Allen Mfg. Co., Barre, Mass.; Fosdick Machine Tool Co., Cincinnati; Lamb & Nash Co., Boston; Bridgeport Safety Emery Wheel Co., Bridgeport, Conn.; Gallmeyer & Livingston Co., Grand Rapids; Micro Machine Co., Bettendorf, Iowa; O. S. Walker Co., Worcester, Mass.; Monarch Machine Tool Co., Sidney, Ohio; Kempsmith Mfg. Co., Milwaukee; Hall-Will, Inc., Erie, Pa.; Columbia Machine Tool Co., Hamilton, Ohio; Hanna Engineering Works, Chicago; Peerless Machine Co., Racine, Wis., and the Steinle Turret Machine Co., Madison, Wis. The company also has the exclusive sales agency for Brooke, Anderson, Inc., Chicago, manufacturers of "Bearingoy," and for the present will handle sales in the Pittsburgh district for the Shaw Electric Crane Co., Muskegon, Mich.

Steel Boiler Orders in March

Order for steel boilers in March are reported by the Department of Commerce at 1391 units, aggregating 1,477,667 sq. ft. of heating surface. The returns are from 68 manufacturers and may be compared with revised figures for February of 1093 units and 1,387,544 sq. ft. Both figures are well above the January totals of 1009 units and 1,163,713 sq. ft.



Reversing Clutches, Splined Shafts and Belts and Pulleys Have Been Replaced by Direct-Acting Electrical Equipment. Two or more castings requiring the same work may be clamped together and machined simultaneously

New Heavy-Duty Draw-Cut Shaper

Simplicity of design, quiet operation and rapid production are features stressed in connection with the heavy-duty, draw-cut shaper here illustrated, which has been brought out by the Mesta Machine Co., Pittsburgh.

The number of moving parts has been reduced to a minimum, reversing clutches, splined shafts and belts and pulleys having been replaced by direct-acting electrical equipment. By this minimizing of moving parts and the use of direct-acting electrical equipment, quietness of operation is said to be secured. The machine is driven by a reversing motor, which is carried on the saddle and drives through a single worm reduction, providing, it is claimed, noiseless and positive action at all times. The stroke of the ram, the feed and traverse motions are controlled electrically, all adjusting motions being quickly accomplished, with slight over-travel of the tool. Rigidity of construction, by the use of well-designed substantial parts, is also

a feature stressed as making possible increased range in all directions, also eliminating vibration and tool chatter.

Two or more castings requiring the same machine work may be clamped together, as shown in the illustration, which pictures two cast-steel shear frames being finished simultaneously. This arrangement eliminates the necessity of moving and resetting the castings, since practically all surfaces requiring machine work may be reached at a single set-up with the long stroke, vertical adjustment and movement along the bed.

The normal stroke of the machine is 100 in. and the extreme stroke 120 in. The bed is 26 ft. long. The longitudinal feed is 19 ft. 6 in. and the vertical feed 9 ft. The feeds range from 1/64 to 1/2 in. Cutting speeds are at the rate of 15 to 30 ft. per min., and return speeds at 30 to 60 ft. per min. Normal cutting is at the rate of 20 cu. in. per min. The machine can be furnished in sizes to suit requirements.

Improves Design of Lever Shear

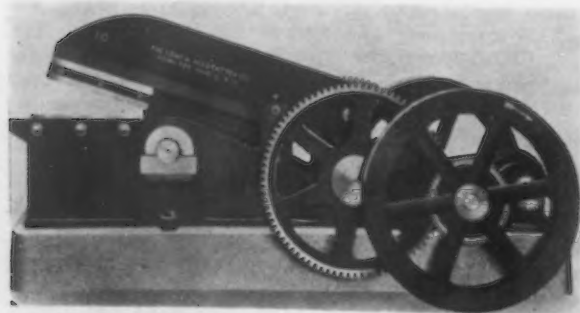
A new lever shear, incorporating improved features, has been brought out by the Long & Allstatter Co., Hamilton, Ohio.

With the exception of the fly-wheels, bearings and tapered liners, the machine is entirely of steel. It is provided with a safety shearing pin, which may be replaced conveniently and inexpensively. The function of this shear pin is, of course, to prevent breakage of main parts in case a piece beyond the capacity of the machine is inserted between the blades. Twin gears are used on the heavy steel crankshaft to balance the load and prevent springing the shaft. These gears are of steel and have machine cut teeth. Bearings are bronze bushed to permit of quick and economical bearing repair. The main lever bearing is bronze bushed

and the side thrust developed when shearing is taken by a tapered adjustable gib. It is pointed out that with this arrangement side play can be taken up without resorting to the use of shims, etc.

Demagnetizer for Small Pieces

A demagnetizer for removing the residual magnetism from small pieces such as hardened washers, rings, cutter teeth, tool bits and reamer blades that have become magnetized through being held on a magnetic



Except for the Flywheels, the Machine Is Entirely of Steel



The Device Is of Coil Type and for Alternating Current

chuck, is obtainable from the Blanchard Machine Co., 64 State Street, Cambridge, Mass.

The device is of the coil type, and is for alternating current only. It is not recommended for single, heavy pieces, although the opening in the device will pass a piece 6½ in. wide and 2½ in. high. The coil is designed for maximum effect consistent with safe temperature when operating continuously. It is completely insulated and inclosed in a brass case for the protection from injury and dampness. The coil is wound for the current on which it is to be operated, and cannot be used on any other. Coils for standard currents are stocked but coils for other currents can be furnished. The weight of the device is 100 lb. net.

Installing Large Steam Drop Hammer

The Henry Vogt Machine Co., Louisville, Ky., is installing the steam drop hammer here pictured, which is notable because of its unusual size as well as for

some special features of design. The machine was built by the Erie Foundry Co., Erie, Pa.

The weight of the reciprocating parts, including the top die, is 20,000 lb., and the total weight of the machine is approximately 250 tons. It was necessary to cast the anvil in three pieces in order to facilitate installation. The height of the hammer over all is 33 ft., but when installed most of the anvil will be below the floor line, which is at the level of the treadle shown just below the saw block.

The working face of the ram is approximately 44 in. square; the cylinder bore is 25 in. and the rod diameter 9 in.

The rated stroke of the hammer is 50 in.

Practically the entire construction of the hammer is either of steel castings or of alloy steel forgings. The frames are of box section and they support the guides on five sides, no provision being made for guide adjustment. Another feature is the bottom separators between the frames, which are of the drop type instead of the usual cylindrical spreaders around the bottom tie bolt. The entire upper works of the hammer form a rigid unit which can be adjusted across the anvil for aligning the dies and for taking up wear, by means of the wedges shown. Taper gibs are provided for taking up wear in the direction at right angles to this movement.

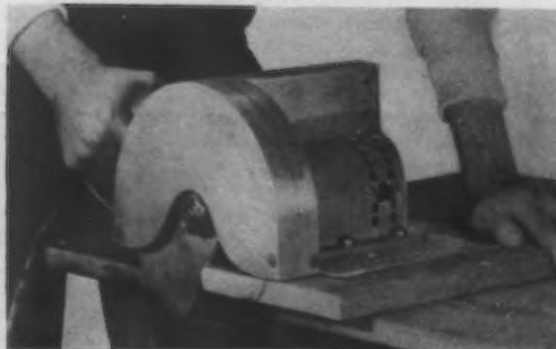
The hammer will be used principally for the manufacture of drop forged valve bodies. It is capable of forging 8 in. valves used for high-pressure, high-temperature service, the outside diameter of which is about 24 in. A double-gear tie rod press, built by the Erie company, is being installed for trimming the forgings made on this hammer.

An inclosed self-ventilating motor, type K, is being made by the Howell Electric Motors Co., Howell, Mich. The inclosure is said to be dust proof, oil proof, acid, fume and moisture proof.

Electric Hand Saw with Automatic Saw Guard

The Lee Pattern Co., 130 Thirteenth Street, Milwaukee, is marketing an electric hand saw a feature of which is the automatic safety saw guard. The machine is light in weight and is designed to minimize strain on the operator.

The machine is arranged for connection to lighting or power currents and is said to cut wood at the rate of 1 in. per min. without pressure on the part of the



The Machine Cuts Wood at the Rate of 1 In. Per Min.

operator. It is arranged so that it may be changed conveniently to permit use by a left-handed operator. After the cut has been made, the machine can be laid on any of its four sides, which feature is especially convenient in cases where the operator is working in a strained position. There is an attachment designed to assure accurate straight and angular cutting, and another for depth cutting.

Gun for Repairing Furnace Walls

For use in facing or coating fire-exposed surfaces of furnace linings, the Botfield Refractories Co., Swanson and Clymer Streets, Philadelphia, has put on the market an air-operated gun with the trade name Adamant. Fire brick cement pre-mixed with suitable refractory materials is thrown on to the surface to fill in depressions or burnt-out sections of brickwork. This builds up the wall to the desired thickness and to a uniformly even surface.

Unusual speed of application is claimed. The entire surface of an average steam boiler is said to be covered in less than an hour. To provide a coating ¼ in. thick, about 1 lb. of the pre-mixture is required for each square foot. Operation is on compressed air at 50 to 80 lb. pressure. Steam can be used, but air is preferable.



Fire Brick Cement, Pre-mixed With Other Materials, Is Thrown on Surface of Furnace Linings

One man handles the operation, for the gun weighs less than 4 lb. It is 18¼ in. long and 10 in. wide. The ½-in. standard pipe thread opening with regulator wheel provides for attachment to any air line. The nozzle, opposite the air entry, is designed to lay the material on the wall without spattering. The supply suction pipe, inserted in a bucket of the mixture, is cut away at one side to facilitate entrance of the mixture. A vent pipe running up the supply pipe and passing through its wall serves to prevent clogging. The force of the stream is under the control of the operator by means of the regulating wheel. The material is laid on with the nozzle about 4 to 6 ft. away from the surface.

Gear Makers to Learn of Gear Noise and Other Research Work

Inspection of the University of Michigan, and in particular the department of engineering research, will be a feature of the eleventh annual convention of the American Gear Manufacturers' Association, to be held at the Hayes Hotel, Jackson, Mich., May 12, 13 and 14.

This inspection tour is planned for Friday, May 13. Following luncheon at the university, the gear makers will learn, at first hand, what this institution has accomplished in gear research, as well as the research equipment available.

During the convention reports will be submitted by the several technical standardization committees of the association, with B. F. Waterman, engineer of the Brown & Sharpe Mfg. Co., Providence, and chairman of the association's general standardization committee, presiding.

The technical papers to be presented and discussed include the following: "The Equilibrium Factor in Gear Shifting," by P. L. Tenney of the Muncie Products Co.; "Gearing Nomenclature—Where Does It Lead Us?" by D. T. Hamilton of the Fellows Gear Shaper Co.; and "Normal Pitch Measurements," by B. Wheeler of the railway equipment engineering department of the Westinghouse Electric & Mfg. Co.

"Standards and Specialization" is the title of the address of welcome to be made by E. J. Frost, president of the Frost Gear & Forge Co., Jackson, Mich., and president of the A. G. M. A. An address by A. H. Gross, president of the Kelvinator Corporation, under the title of "Bulls or Bears," is planned for Friday morning, May 13.

An informal banquet, with F. W. Sinram, president of the Van Dorn & Dutton Co., Cleveland, and honorary president of the A. G. M. A., as toastmaster, has been arranged for the evening of May 13. The principal speaker will be Dr. Frederick Spence, who will talk on "Some Needed Emphases in Industrial Relationships."

Youngstown Company Expands Directorate

As reported in the personal column of THE IRON AGE last week, the board of directors of the Youngstown Sheet & Tube Co. has been expanded from 11 to 14 members. The old directors were all reelected. The new directors include Frank Purnell, assistant president; H. G. Dalton, first vice-president, and Harry S. Coulby of Cleveland. At the directors' meeting, President Campbell was reelected to his present office for the twenty-fourth time.

In his statement to stockholders, Mr. Campbell mentioned a series of unfavorable factors affecting the business, including the effects of the Mississippi flood, excess steel ingot capacity, price weakness in finished steel, and the inflow into this country of foreign-made steel. Among the most serious influences affecting adversely the Sheet & Tube company is the curtailment of operations in the oil country fields. This has reduced the distribution, through the company's 77 stores, of pipe and oil country goods in general. Mr. Campbell predicted that the present depression in the oil fields would be longer than usual.

Optimistic Over General Situation

Despite the considerable number of unfavorable influences retarding the steel trade at the moment, President Campbell expressed optimism over the general business conditions. Among the favorable economic factors he pointed out the satisfactory monetary situation, predicted a better volume of railroad buying this

year than was experienced last year, said that the automobile business is about up to expectations, and that the continuance of building operation volume is exceeding expectations.

Mr. Campbell said that his company had built its tin mills and seamless tube mills one year too soon. He criticized the United States Shipping Board for reducing freight charges on steel shipped into this country, on the ground that this constitutes an encouragement for importation of foreign-made material.

Steel Window Simplification Eliminates 93 Per Cent of the Styles

WASHINGTON, May 2.—The variety of manufactured solid section steel windows was reduced from 42,814 to 3010, as the result of a simplified practice recommendation unanimously adopted here on April 28 at a general conference of producers and users, held under the auspices of the National Committee on Metals Utilization. In addition to making a reduction of 93 per cent in variety of these windows, the recommendation established a clear and concise method of classifying and indexing the divisions of products of the steel window industry, the program becoming effective on Sept. 1. The recommendation lists a revised table of nomenclature which will assist in clarifying negotiations between manufacturers of the windows and the architects and general contractors.

Inland Steel Has Record First Quarter and Optimism for Rest of Year

The Inland Steel Co., Chicago, announces net earnings for the quarter ended March 31 of \$2,130,926, compared with \$1,540,909 in the first quarter of 1926, and equivalent after preferred dividends to \$1.65 a share on the common stock. Earnings on common for the corresponding quarter of last year amounted to \$1.15 a share. Commenting on the situation at a recent directors' meeting, President P. D. Block said: "We have again made a new record for the first quarter of the new year. It is the very best we have ever enjoyed in tonnage produced and in relative cost. We have good prospects for a fair operation in the second quarter. It would be rather bold to forecast a continuance of this large volume for the rest of the year, but the experience of the past few years—'hand to mouth' buying, no surplus stocks, etc.—suggests favorable trade conditions in the steel industry for 1927."

Domestic Producers of Manganese Ores Form a Protective Committee

Following the adjournment of the meeting of the American Institute of Mining and Metallurgical Engineers in Cleveland, on April 20, a voluntary committee of American producers of manganese ore was formed for the purpose of protecting and advancing the interests of such producers. The committee is composed of J. Carson Adkerson, Woodstock, Va.; N. H. Manna-kee, Bluefield, W. Va.; H. A. Pompelly, Owego, N. Y.; J. H. Cole, Phillipsburg, Mont.; Wm. D. Meyering, City Hall, Chicago. It is stated that a convention will be called at an early date to advance the interests of producers of manganese ores in the United States.

Ten reinforced concrete and steel coaling stations, with automatic conveyors, and 10 locomotive sand and six automatic cinder conveyors are to be supplied to the Southern Railway System by Fairbanks-Morse & Co., Chicago.

Schedule of the next installments of the Business Analysis and Forecast, by Dr. Lewis H. Haney, Director, New York University Bureau of Business Research, follows: May 12—Activity in Steel Consuming Industries; May 19—Position of Iron and Steel Producers; May 26—General Business Outlook.

New Rate Structure for Southwest

Commission Prescribes Sweeping Changes in Iron and Steel Rates, Setting Up Distance Scales

BY L. W. MOFFETT

WASHINGTON, May 3.—Declaring that rates on iron and steel products are in even more chaotic condition than those on other articles, except in Arkansas, southern Missouri and western Louisiana, where rates prescribed in the Memphis-Southwestern investigation apply, the Interstate Commerce Commission in its recent decision in the Consolidated Southwestern cases established rates based on distance scales devised so as properly to apportion the charges for long and short hauls. Sweeping changes are made by this decision in iron and steel rates as well as in rates on many other commodities to Oklahoma, Texas, points in Arkansas and Louisiana west of the Mississippi River and to parts of Kansas and Missouri. The opinion also covers a revision of rates from and to grouped points in the States beyond the Missouri and Mississippi rivers and east of the Rocky Mountains. The latter rates are to be constructed by addition of specific amounts or arbitraries up to or beyond Kansas City, St. Louis, Memphis, Vicksburg or New Orleans, as the case may be. Ocean-and-rail group rates from and to north Atlantic ports and interior points by way of south Atlantic and Gulf of Mexico ports are prescribed.

Iron and Steel Rates 32.5 Per Cent of First Class

On iron and steel rates the distance scale sets up a percentage of 32.5 per cent of the first class rates, while on scrap it provides for 17.5 per cent of the first class rates. While the exhaustive report, consisting of about 400 printed pages, one of the most voluminous ever issued by the commission, has not as yet been analyzed in detail, it is declared that it will mean some small increases in rates on iron and steel products to Arkansas and Louisiana but for the most part provides for sharp reductions, especially to Oklahoma and Texas points. In the event the carriers put the scale into effect to Kansas points which were not involved in the investigation, substantial decreases also will be made. The commission set Dec. 5 as the effective date for its order, indicating the great amount of work that will be entailed in preparing the tariffs.

Prepared by Commissioner Lewis, the report was unanimous. While it principally covers the interstate rates, intrastate rates were found to be unduly preferential and to discriminate unjustly against interstate commerce where and to the extent that they are relatively lower than the approved interstate rates. The necessary readjustment of the intrastate rates is left to the State commissions and to the railroads, in accordance with the customary practice.

The investigation disclosed the chaotic condition of the present rate structure in the Southwest and that the tariffs are complicated, ambiguous and unsatisfactory. Many existing rates for given distances were found to be two or three times as high in part of the territory as in other parts, despite the fact that transportation conditions were found to be substantially similar throughout the Southwest, western and southern Kansas and southern Missouri. The commission held that in order to enable each city or town to obtain the share of trade to which its advantage of location entitles it, a general readjustment of all of the rates is necessary on a comprehensive plan which will enable tariffs to be simplified and will afford the shippers like rates for like services. The commission stated that the decision probably goes further in the direction of abolishing rate inequalities and bringing about simplified tariffs than any previous decision.

Texas Common Point Territory Abolished

In meeting charges of undue prejudice and preference the commission abolished the extensive so-called

Texas common-point territory, although limited groupings were authorized. In meeting these charges the commission also placed contiguous parts of Kansas and Missouri on a parity with Oklahoma and Arkansas. The decision originated in several complaints of unreasonable rates and of discrimination and preference as between competitors, principal among which were the complaints filed by the Oklahoma commission and the associated northeastern Texas cities, including Dallas, Fort Worth and Paris.

For the Southwestern States a distance scale of first class interstate rates is prescribed, applicable to both single and joint-line hauls. It has a different progression, but will average on the whole about 10 per cent higher than the class scale recently prescribed by the commission for the Southeast. The same scale was approved for Kansas and southern Missouri, except those portions within approximately 150 miles of the Missouri River cities, for which a scale about 7 per cent lower was approved.

A new rate structure is provided. It consists of 10 class and nine commodity scales. The construction is such that additional scales may be inserted as found desirable or necessary. Maximum reasonable rates on about 35 particular commodities were prescribed by assignment of the commodities to certain of the class scales or certain of the nine commodity scales. Distance scale arbitraries were provided for addition to the rates in the so-called Texas differential territory in the western part of the State and on the Rock Island line between Texhoma and Tyrone in Oklahoma, as well as for financially weak lines. The scales are to be applied to short-line distances, except that points of origin and destination may be grouped where the hauls exceed 150 miles, the group rates to represent fair averages of the point-to-point scale rates and the groups of points to be graded in size as distances increase.

Miscellaneous Steel Products to Take Different Rates

The iron and steel list includes the great bulk of the manufactured products, such as plates, sheets, bars, structural material, boiler plates, wire, nails, horse-shoes, chains, agricultural implement parts, pipe and castings, but a distinction is made in the rates of some of the products.

The order provides a common rate in the staple articles in the merchant iron, structural and wire lists, but on a number of the miscellaneous items which were included in such lists in the Memphis-Southwestern case, or which in some instances move on the same rates from and to points not within that decision, the commission said somewhat higher rates may well apply. It stated that a minimum weight on the staples higher than 36,000 lb. is justified. The scales provided, it was added, should average somewhat higher than those prescribed in the Memphis-Southwestern case.

Regarding scrap, the commission prescribed a general basis of rates throughout the Southwest not materially different from the rates prescribed in the Memphis-Southwestern case. At the same time it said there was no evidence to show that undue prejudice or preference would result from the maintenance of somewhat lower rates from Southwestern points to the gateways than are applied locally between points in the territory, provided that such rates are necessary to enable the marketing of scrap produced in the Southwest at the important markets on, north and east of the Mississippi River and provided that such lower rates are necessary to meet the competition of similar commodities from other territories reaching the same markets.

CONTENTS

May 5, 1927

Electrochemistry After 25 Years	1277
Research Active in Welding Field	1288
Sparrows Point Wire and Rod Mill	1291
Historic Iron Making Property Passes Into Discard.....	1298
Finds Industrial Outlook Bright	1301
Rates Called Discriminatory.....	1305
New Rate Structure for Southwest	1311
April Iron Output Exceeds March	1318

Steel in Dwellings	1285
What Size Ideal Inventory?.....	1286
National Museum of Engineering and Industry Holds Annual Meeting.....	1287
Manufacture of High-Pressure Boiler Drums	1300
To Operate Chain of Water Terminals.....	1304
Freight Rates	1304-06-07-11-36
Patent Office Appeals.....	1307
Railroad Holds Welding Meetings.....	1307
Arch Machinery Co. Completes Organ- ization	1307
Youngstown Company Expands Directo- rate	1310
Steel Window Simplification.....	1310
Inland Steel Has Record First Quarter.....	1310
Domestic Producers of Manganese Ores Form a Protective Committee.....	1310
Correspondence	1316
To Promote Industrial Welfare.....	1317
Bookings of Fabricated Steel Plate.....	1317
Shipments of Fire Apparatus.....	1336
New Jones & Laughlin Officers.....	1341
To Build Japanese Electric Plant.....	1346
Large Machinery Exports in March.....	1347

NEW EQUIPMENT

Heavy-Duty Draw-Cut Shaper.....	1308
Improves Design of Lever Shear.....	1308
Demagnetizer for Small Pieces.....	1308
Large Steam Drop Hammer.....	1309

Electric Hand Saw with Guard.....	1309
Gun for Repairing Furnace Walls.....	1309

STATISTICAL

Increase in Steel Furniture.....	1297
Steel Boiler Orders in March.....	1307
Where Scrap was Exported Last Year.....	1346
Large Machinery Exports in March.....	1347
Japan's Machinery Output.....	1348

MEETINGS

American Electrochemical Society.....	1277
American Management Association.....	1286
American Welding Society.....	1288
National Metal Trades Association.....	1301
American Gear Manufacturers' Associa- tion	1310
Open-Hearth Furnace Meeting.....	1319

DEPARTMENTS

Editorial	1314
Iron and Steel Markets.....	1320
Comparison of Prices.....	1321
Prices, Raw and Finished Products.....	1323-1325
Structural Awards and Projects.....	1337
Railroad Equipment Buying.....	1337
Non-Ferrous Metals	1338
Reinforcing Steel Business.....	1339
Personals	1340
Obituary	1342
European Steel Markets.....	1343
Machinery Markets	1349

THE IRON AGE and Electrochemistry

IN this issue is reported the jubilee meeting of the American Electrochemical Society. More than being a record of technical developments, the account throws light on happenings which have influenced industrial progress broadly and it also indicates success in research through an association.

The electrochemists' organization has specialized on symposia as a means of crystallizing technical information (incidentally helping thereby to eclipse the basic meaning of symposium, which would be a sub-rosa proceeding in these Volstead days). THE IRON AGE has covered these symposia promptly and completely and has thus been a useful instrument in recording the results of such notable gatherings as have been held by the society on ferroalloys, electric steel, electric gray iron, industrial electric heating and corrosion.

This Issue in Brief

Equalizes inventory by measuring stocks in terms of days. In this way inventory may be related to true needs, revealing at once those items which are overstocked and those of which there is an undersupply.—Page 1286.

Is it cheaper to buy castings than to make them? Ohio State University study reveals that many manufacturers have found it advisable either to sell their foundries or lease them, finding it cheaper to buy castings. But other manufacturers declare that only by conducting their own foundries can they obtain the quality of castings they require.—Page 1286.

"Mushrooming" of resistance welding electrodes may be overcome by copper tungsten. This alloy has a compressive strength more than three times that of hard copper. Its use will eliminate the flattening which causes large welds, with accompanying variations in current densities.—Page 1288.

March machinery exports were largest in several years. Value was close to 39 million dollars, a gain of 32 per cent over February.—Page 1347.

Low temperature reduction of iron ore is said to make superior iron. Excessively high temperatures of blast furnace bring about a reduction of the stable oxides, resulting in an iron containing objectionable impurities. New process, by producing the reducing gas separately, enables direct reduction to be carried on continuously.—Page 1281.

Says tin can be made for 1½c. per lb. Tests of electrolytic reduction process, applied to Bolivian concentrates, warrant belief that United States can be freed from the nightmare of constantly mounting tin prices. Thirty dollars per net ton is said to cover all costs.—Page 1284.

Galvanized sheets spot welded satisfactorily by using electrodes with rounded points. Use twice the current and half the pressure employed when welding black metal. Zinc should not be removed from the points, though they should be kept in shape by constant filing.—Page 1288.

Electric steel industry has made great strides in 17 years. From 6 furnaces in 1910 the industry has grown to more than 500 furnaces, with an annual capacity of more than 615,000 tons.—Page 1279.

Hydrogen found to be effective reducing agent for tin concentrates. Better than carbon monoxide. Percentage of reduction decreases in proportion to the amounts of carbon dioxide and nitrogen in the gaseous mixture.—Page 1283.

Most processes for producing iron direct from the ore founder on the rock of high cost. And the average product is poor commercially and not worth the price of scrap steel, says Dr. Stoughton.—Page 1282.

Lowers costs and increases output by figuring production schedules in "man days." Definite shop schedules are issued each week. Available labor-hours are scheduled or budgeted. Time required to do the work is calculated in advance, and this is used as a standard of comparison to actual performance. Thus labor cost in the expense budget is made a fairly definite factor.—Page 1287.

Rod mill is entirely gear driven. Tendency to "jump" the rolls has been overcome by the use of specially cut helical spiral gears in new Bethlehem rod mill. Thus the uncertainty of belt drive, with attendant loss of power due to slippage, has been eliminated.—Page 1292.

High pressure boilers are made by welding plate into a cylinder and upsetting each end in a vertical press. Test pressures are carried as high as 5000 lb. per sq. in. Total cost of boilers made by this process is about two-thirds that of forging from the ingot.—Page 1300.

Business outlook is good, declare majority of members of National Metal Trades Association. Only 3 per cent report that prospects are "poor."—Page 1301.

Urges industry to provide old-age pension by payroll deductions. If manufacturers do not take the lead, the State will inevitably enact a pension law which may not be acceptable to all industries, says E. G. Plowman.—Page 1302.

"Business cycle theory is the worst bogey confronting American industry." There is no reason why a depression should occur in 1928 or in any other year, says chief economist of National Industrial Conference Board. All cycles are man made. National income has increased 30 per cent since 1922 and should not stop increasing.—Page 1302.

High freight rates favor foreign steel mills, Buffalo steel manufacturer asserts. Declares that foreign steel reaches Atlantic seaboard at \$4 per ton cheaper than price at which Pittsburgh, Buffalo, or Youngstown producers can make delivery.—Page 1305.

Wire-drawing blocks automatically stop when snarl or kink occurs. Wire passes through a metal ring mounted on an arm connected with a cut-off switch.—Page 1292.

April daily pig iron output was 1.5 per cent above March. Average production was 114,074 tons per day, a gain of 1708 tons. On May 1 there were 220 furnaces in blast, a loss of 3 for the month.—Page 1318.

ESTABLISHED 1855

THE IRON AGE

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Sheet Trade Comes to a Test

JUST now the much mentioned price troubles of the sheet steel trade are being brought to a definite issue. It has long been claimed that sheet prices were profitless or productive of actual losses, but there has been conversation or ejaculation on the subject rather than fruitful discussion. Now a crucial test is provided for the large number of sellers who have been engaged in this interesting trade. Beginning last Thursday various producers have been advancing their prices by what buyers will consider a stiff amount, though these advances are no greater than seem necessary to put the sheet industry upon a reasonable footing.

An understanding of causes would be promising of results in any effort to improve the sheet situation. Discussion has been of symptoms rather than of fundamental causes. A comparison of operating percentages in the sheet industry and in other steel finishing branches is favorable to sheets, indicating that better results ought to have been secured in marketing. W. S. Horner, who has just resigned the presidency of the National Association of Sheet and Tin Plate Manufacturers after ten years of service, made a study from which the figures were shown in an article in THE IRON AGE of April 14 last, page 1092. The excess of sheet capacity over consumption (indicated by shipments) was 26 per cent in 1924, 15 per cent in 1925 and only 12 per cent in 1926. Few if any other branches of the finished steel trade could make such a showing, yet they have all fared better in earnings than the sheet industry. And it is just in this period, when the relationship between requirements and productive capacity was growing almost perfect, that the sheet-market has dropped into its parlous state.

Evidently the difficulty does not lie in the circumstances in which the sheet trade as a whole has found itself. Apparently the difficulty lies in the marketing practices of the individual members of the trade. Repeatedly it has been said the mills run too heavily for the amount of business available. It is clear that they do, the monthly reports

of independent sheet mills having repeatedly shown much greater fluctuations in production than there could have been in actual consumption. From July to October last there was an increase in production of 31 per cent, while two months later, in December, there was a decrease of 29 per cent, and March production was at just 50 per cent higher rate than December. Only a few weeks after this spectacular gain the sheet trade finds its market in the poorest price situation of all.

The explanation frequently offered for these obvious periodic excesses is that producers aim to improve costs by high operating rates. That is a lame explanation, for methods of production make the incentive less than in almost any other finishing branch of the steel trade. Each sheet plant contains many units, and more or fewer can be operated. A rail, beam, or continuous merchant bar mill is different.

The present effort to advance sheet prices is distinguished from various predecessors by the amount sought being larger, while previous efforts have not had much success or the sheet market would not have gone where it has in the past few weeks. The very largeness of the advance may prove to be an advantage rather than a detriment, in that it offers the individual producer a larger reward for a serious effort.

As human affairs go, a poor market frequently grows worse because there seems to be little or nothing worth preserving. A real solution, instead of a mere palliation, is more worth striving for and that makes the present undertaking one that will be watched with keen interest.

Twenty-five Years in Electrochemistry

FIFTY years ago electrochemical processes were little known. Twenty-five years later, when the American Electrochemical Society was formed, the science was fairly in its prime. In summing up the quarter century's growth, Dr. Colin G. Fink, the society's secretary, says in substance of the situation in 1902:

Accomplishments along both theoretical and practical lines were attracting world wide atten-

tion. Moissan's fundamental electric furnace experiments suggested vast possibilities on a commercial scale. Acheson and Tone, at Niagara Falls, were making graphite and carborundum in ton lots. Others were fixing atmospheric nitrogen, and Edison had launched his new nickel-iron storage battery, with Roeber expounding the theory of its operation. Aluminum, the "silver queen of the electrolytic cell," was selling at 35 cents per pound against \$1.50 ten years before.—*Chemical and Metallurgical Engineering*, April, 1927.

By 1927, American industries based on these developments have grown to large proportions. Products of the electrode and carborundum plants have become the working tools of even greater industries. Moissan's dream is a reality and the electric furnace has made possible the great ferro-alloy and electric steel industries with quality steel advanced to the class of tonnage products. Aluminum is not only available in large quantities at new low prices, but its sister metal, magnesium, has become a commercial product, while alloys of these and other metals—the "strong, light alloys"—point the way to revolutions in some lines of construction. And today various major metals are turned out in vast quantities by the magic of electrochemistry.

Surviving members of the small group of wise and imaginative men who, in 1902, founded a society to serve this industry see their dreams come true and their confidence vindicated. It was fitting that the silver anniversary of the American Electrochemical Society was celebrated last week near the grave of Benjamin Franklin and in a building named for him, standing not far from the scene of Robert Hare's work of more than a century ago that is a bright chapter in the early history of electrochemistry in America.

Direct Reduction Nearer the Goal

PROBABLY the first symposium ever held on the subject of gaseous reduction of metallic oxides was the one which is reported quite fully on other pages in connection with the meeting of the American Electrochemical Society. Several new processes were described and old ones reviewed.

A successful outcome of this long quest now seems near. The list of failures is long, but the work of the pioneers has shown what pitfalls are to be avoided. Some of these earlier seekers made definite contributions to the solution of the problem. Probably none came nearer success without winning out than John T. Jones, of Iron Mountain, Mich., who fifteen or twenty years ago applied his "step" process to the reduction of low-grade Lake ores and employed the rotary kiln and powdered coal. It was developed at the Philadelphia meeting that already one American process is nearing the commercial stage. Another is not quite so far advanced, and a foreign process is about to be installed in this country, while that of an American is to be operated in Japan.

Experimentation thus far has been long on theory and short on recognition of practical and commercial considerations. Even as the Steel Corporation is going forward with its large expenditure for a Hornsey plant at Lorain, Ohio, opinions as to various metallurgical and other details are conflicting, even bewildering. But out of all the

maze of variant views, as seen in the discussion at Philadelphia, it need not be doubted that a low-cost process, widely applicable, will emerge.

Meanwhile praise is due the American Electrochemical Society for successfully putting through a program which has made notable contributions to the literature of direct reduction, not only of iron ore but of ores of tin, zinc and other commercially important metals.

Union Labor and Waste Elimination

A CONFERENCE that ought to bear fruit in better industrial relations was held in Philadelphia last month. It was under the auspices of the Central Labor Union of Philadelphia and the Philadelphia Labor College. The subject was the elimination of waste in industry, and the object was to bring to the attention of the rank and file of organized labor the pronouncement adopted at the Atlantic City convention of the American Federation of Labor. The sessions extended over two days, the attendance was in the hundreds, and the speakers were officers of the local labor unions, the officers of the American Federation of Labor, including President Green, and four engineers and an economist, all of national reputation. These last five were asked to present to the conference the technical and economic aspects of waste elimination.

It is significant that the conference was arranged by labor and for labor. The labor leaders said in their addresses that waste in industry bears as heavily on labor as on any other class, if not more heavily, and that labor is bound to consider means of lifting this burden. The two wastes most stressed were the waste of man power due to death and injury as the result of industrial accidents, and the waste from unemployment, although other sources, including limitation of output, were not ignored. The speakers said in so many words that labor is committed to this movement and that the rank and file will have to do their share.

The Philadelphia conference is an encouraging sign. It represents a refreshing change for organized labor, which for years has put on the employer the whole burden of improving conditions, while insisting that labor reap the benefits of the improvements.

We shall not discuss here the claim of the union speakers at Philadelphia that the elimination of waste can be best assured through the medium of the closed shop. That was to be expected in a labor union meeting. The main thing is to have organized labor recognize that it has a duty to perform and that it is ready and willing to cooperate with the employer in its performance. If labor has learned that bad management is a waste that affects the workman just as surely as it does the employer, and is ready to work with the employer to eliminate such waste, it is on a sounder basis than it has ever been in its history, and it will find that its relations with the employers will be more cordial than ever. Managements usually are ready to talk with workers when convinced that they are acting in good faith.

Following the pronouncement of the American Federation of Labor, members of the Philadelphia conference contended that some of the savings due to a successful campaign of waste elimination go

into the pay envelopes of the workers. If the workers give their whole-hearted cooperation to the making of savings, fairness demands that they should share in the benefits arising therefrom. Also, good business sense will see that they do. Elimination of waste means more production per man. There is little use for more production if the increase cannot be absorbed by the buying public. This point was stressed time and again at the Philadelphia conference, and it was emphasized that when part of the saving due to increased production goes into the pay envelope the workers are put in position to become better buyers. But right here the labor spokesmen overlook the fact that part of the saving must go to the consumer; that often the manufacturer must lower his price to market his increased production; also that agricultural and other buyers not in the factory division make up a large part of the consumer army.

Organized labor has much to live down in the stand it has taken against efforts to increase output. Year after year it has slowed down production by getting Congress to prohibit time studies on work done for or by the Government. Of late statements of some of its leaders indicate that its attitude is changing. But it has a long road to travel before a new public opinion will be formed. If conferences like that at Philadelphia are held elsewhere and bear the fruit which the leaders have said they hoped for, confidence will grow that the construc-

tive forces in the American trade union movement are making headway.

Shifting of Ability to Save

REFERRING again to the increase in deposits in savings banks and the suggestion lately made in these columns that this may not reflect augmentation in national saving but rather a shifting in the ability to save, as among classes of people: Some wonder is expressed as to how this can be. However, some conditions of this nature are clearly evident.

If town dwellers are able to buy their food relatively cheaply their opportunity for saving is manifestly enhanced. If the cost of government is made to fall especially on the well-to-do through heavy taxation on corporations and surtaxes on individual incomes the great body of citizens is relieved and is better able to accumulate.

Restraint upon railroad rates has a similar effect. The major steam railroad systems of New England afford an apt illustration of this. Just as their managements have succeeded in accomplishing profitable operation again, their labor is making a new claim upon the proceeds. Railroad workers may have been able to increase their deposits in savings banks but it has been a long time since the stockholders of New England railroads have had any such ability out of their investments.

CORRESPONDENCE

Iron Made 66 Years Ago

To the Editor: The markings on the cast struts of the chain links described in the article entitled "Iron Made About 66 Years Ago," in *THE IRON AGE*, April 14, are easily deciphered and afford a clue to the history of this chain and anchor. "W. N. Y." is the customary stamp of the Washington Navy Yard and indicates that the chain in question was a product of this yard. Further confirmation is afforded by the fact that, at about this period, all wrought iron for use by the Navy and for that matter, for use by most other Government establishments, was being bundled and re-worked at this yard's chain shop into the finished sizes desired. Links, of exactly the same type and with the same markings as those described in the article referred to, are now in use on the electrically driven docking gear of the marine railroad of this yard. Thus the conclusion of the author of the article as to how the chain arrived at the location at which it was uncovered is probably correct.

Careful inspection of the anchor at the junction of the shank and the flukes may reveal the date of manufacture and the weight which were usually stenciled at this point.

The striations in the etched cross section of the wrought iron link are consistent with the practice employed in those days, of using large amounts of iron plate scrap, working down the faggots always in the form of squares and then finally rounding in a swage.

The results of recent experimental work in the corrosion of metals leads rather naturally to the assumption that the composition of these articles cannot be but a secondary factor in accounting for their state of preservation. If the photomicrographs of the wrought iron are truly representative of all of the cross section of the metal, the proportion of slag is not particularly high and consequently preservation cannot

be ascribed to it. The answer appears to lie either in the physical character of the clay in which the chain was embedded, or in the conditions of access of oxygen to the metal, or both.

JEROME STRAUSS,

Material Engineer.

United States Naval Gun Factory, Washington, April 27.

Controlling Departmental Burden

To the Editor:

The rapid industrial evolution of the past few years has forced our company, like many others, to discard separate cost records and, after determining the classes of expense applicable to cost of production, to institute a cost system so laid out as to command its place on the trial balance and balance sheets. Omitting the technique and general routine of the cost system, the manner in which departmental burden is controlled is as follows:

Eliminating the sales, administrative and commercial expense items those properly chargeable to factory burden include heat, light, power, water, taxes, insurance, lubricants, supplies, experimental work, maintenance, depreciation, and indirect labor (factory only). The item of indirect labor, having been charged directly through the voucher register to the department in which the work was performed, may be redistributed by special journal entry to other departments because of work done by one department for another. Items for maintenance purchased outside are charged directly through the voucher register to the proper department (later to the group and unit) and power, water, etc., are prorated and are also charged directly through the same medium. Supplies and parts for maintenance taken from stock are charged to their respective departmental accounts by journal entry made up from the reports of material used, as submitted by the store room clerk. These accounts are properly chargeable to overhead in process but are set down by departments on a form which, for want of a better name, is called Ratio of Expense to Cost of Production.

A monthly manufacturing statement shows the aggregate outlay for labor, material and burden, which

is the amount charged into production for the month. A typical example is the following:

Overhead	\$2,810.80—	23	per cent
Material	5,472.26—	44.8	per cent
Labor	3,930.69—	32.2	per cent
Total	\$12,213.75	100	per cent

With normal sales and turnover, an increase in the percentage of cost of sales to sales on the profit and loss statement will cause the ratio of these items to change, and an analysis should be made of the offending item. It should be borne in mind that an increase in any one of these items will cause the percentage of the others to drop. Should the item for analysis be direct labor, the time should be checked to ascertain why additional time was required. If material (raw material), the report of material used should be audited to determine why the additional material was necessary. Burden, however, is usually more difficult to analyze, as it is made up of so many items. However, if the monthly burden chargeable to production, as above, is \$2,810.80, or 23 per cent, then the aggregate of the total departmental burden items from the Ratio of Expense to Cost of Production report should be \$2,810.80 and 23 per cent as follows:

Ratio of Expense to Cost of Production		
Date		Per Cent
January—Machine shop No. 1..	\$1,497.93	12.3
January—Machine shop No. 2..	123.02	1
January—Dept. A	807.73	6.6
January—Dept. B	382.12	3.1
January—Total	\$2,810.80	23

Assuming that the department showing the principal increase in expense is Machine Shop No. 1, examination of the departmental account will readily disclose the particular item or items responsible.

Departmental Expenses		
Month of January		
Machine Shop No. 1		Per Cent
Indirect labor	\$800.00	53.4
Heat	50.00	3.3
Power and light.....	180.00	12
Water	5.00	.3
Supplies	200.00	13.4
Maintenance of machinery...	150.00	10
Maintenance of building....	10.00	.7
Miscellaneous	102.93	6.9
Ratio 12.3 per cent.....	\$1,497.93	100

G. C. MILLER,

Secretary-Treasurer Lakeview Drop Forge Co.
Erie, Pa.

Heavy Bookings of Fabricated Steel Plate

Bookings of fabricated steel plate in March aggregated 52,819 tons, or 71 per cent of capacity, according to reports received by the Department of Commerce. While this was below the February figure of 57,060 tons and the November total of 60,367 tons, it was otherwise the largest monthly aggregate in more than two years. It compares with 39,764 tons in March, 1926. For the first quarter, the total was 143,947 tons, an increase of 38 per cent over the 1926 first quarter, which provided 104,789 tons. In the last quarter of 1926, the total was 129,618 tons.

March bookings included 24,127 tons for oil storage tanks, 1886 tons for refinery materials and equipment, 5109 tons for tank cars, 4597 tons for gas holders, 857 tons for blast furnaces and 16,243 tons for stacks and miscellaneous work. This latter item is the largest under that head since last May. The same statement is true as to the gas holder tonnage. The amount going into oil storage tanks was exceeded by February and also by November, but otherwise was the greatest total in much more than a year.

Shipments of steel barrels by members of the Steel Barrel Manufacturers Association are reported at 356,453 units in March, with a total value of \$1,142,003. Capacity was utilized to the extent of 50.4 per cent, representing 57.6 per cent in light barrels, but only 26 per cent in I. C. C. barrels. New Jersey received about one-third of the total shipments, while Pennsylvania and New York together took about 30 per cent.

St. Louis Club, with \$1,000,000 Fund, to Promote Industrial Welfare of City

ST. LOUIS, April 28.—The Industrial Club of St. Louis has been organized, with Thomas N. Dysart, of Knight, Dysart & Gamble, investment brokers, as president, to promote the industrial welfare of the city and its industrial district, through a fund of \$1,000,000 to be used over a period of four years. The first subscription of \$50,000 came from Charles Rebstock, who gave \$1,000,000 last year to Washington University. Specific activities of the Industrial Club, which is composed of approximately 30 men more than 55 years old and 100 younger men, are to be:

1. Sponsoring of industrial bureau, with adequate budget.
2. Selection of director and operating staff for industrial bureau, to be under supervision of advisory committee of six from the club membership.
3. Taking over by special committee of Industrial Club of the Municipal Advertising Committee, which has been carried on by a joint appropriation from the city of St. Louis and business interests.
4. Raising of fund of \$1,000,000 to be spent in a four-year program of organized development of St. Louis.
5. Supervision of the expenditure of this fund by finance committee of the club.
6. Appointment of a committee by the club to determine and supervise its relations with the Chamber of Commerce and other organizations interested in furthering the industrial and social development of the city's industrial district, so that useless duplication may be avoided and the work of such organizations concentrated on accomplishing specific results.

Dr. W. F. Gephart, vice-president of the First National Bank, is chairman of the plan and scope committee of the club. The Municipal Advertising Committee, which will be taken over by the Industrial Club, was organized seven years ago, during which time 222 new industries in 12 lines have come to St. Louis. Of these, 74 came as a direct or indirect result of the advertising. Of 41 new industries located in St. Louis last year, 11 are directly traceable to the municipal advertising campaign.

Rapid Growth of Manufactures in the United States

Measured by physical volume, the output of American manufacturing industries increased 163.4 per cent between 1899 and 1923, according to a study made for the Department of Commerce by Prof. Edmund E. Day, University of Michigan, and Woodlief Thomas of the Federal Reserve Board. This enormous increase in production was accompanied by an increase of 88.2 per cent in the number of wage earners and of 229.6 per cent in the primary horsepower utilized. It may be noted that the growth of population in the same interval of 24 years was 49.3 per cent.

Not all industries had the same measure of growth. Using 100 as a base in 1919, figures for the iron and steel industry show a gain from 43 in 1899 to 131 in 1923. This increase figures out at 205 per cent. A still heavier rate of growth is shown by paper and printing, which went from 37 to 137, representing an increase of 270 per cent. Chemical and allied products, going from 30 to 125, recorded an increase of 317 per cent. The non-ferrous metals and their products advanced from 31 to 126, a gain of 306 per cent, while automobiles and other vehicles, jumping from 5 to 181, registered an increase of more than 3500 per cent.

Among other industries, shipbuilding fell off about 11 per cent and lumber increased only 1 per cent. Textiles doubled, while food and kindred products advanced 111 per cent.

Considered alone, the iron and steel industry shows successive advances from 43 in 1899 to 52 in 1904 and 75 in 1909. There was a drop to 71 in 1914 and a jump to 100 in 1919; then a sharp drop to 57 in 1921. The rapid increase to 131 in 1923 was followed by a further slight advance to 132 in 1925.

April Iron Output Exceeds March

Daily Rate 1708 Tons or 1.5 Per Cent Larger Than March—

Heaviest Production Since April, 1926—

Net Loss of 3 Furnaces

APRIL pig iron production, compiled from data gathered May 3 largely by wire, shows a small increase over March. Only a few companies estimated their output for the last day or two. The April rate was 114,074 gross tons per day, a gain of 1708 tons over March or about 1.5 per cent. This is the highest rate this year and compares with 115,004 tons per day in April, 1926. It is also the largest production since that month. Previous to April, 1926, the next largest April output was in 1923 at 118,324 tons per day.

Production of coke pig iron for the 30 days in April was 3,422,226 tons or 114,074 tons per day as compared with 3,483,362 tons or 112,366 tons per day for the 31 days in March. In April, last year, 3,450,122 tons was the production, or 115,004 tons per day, an increase over April, this year, of 930 tons per day.

Capacity Active on May 1

There was a net loss of 3 furnaces last month, 8 having been shut down and 5 blown in. In March,

a net gain of 6 furnaces was recorded. The loss in April was the first this year, each previous month having shown a gain.

On May 1 there were 220 furnaces active as compared with 223 on April 1. The estimated daily ca-

Daily Rate of Pig Iron Production by Months—Gross Tons

	Steel Works	Merchants*	Total
April, 1926	89,236	25,768	115,004
May	86,682	25,622	112,304
June	82,186	25,658	107,844
July	79,392	24,586	103,978
August	78,216	25,025	103,241
September	81,224	23,319	104,543
October	83,188	24,365	107,553
November	82,820	25,070	107,890
December	74,909	24,803	99,712
January, 1927	75,609	24,514	100,123
February	80,595	24,429	105,024
March	86,304	26,062	112,366
April	87,930	26,144	114,074

*Includes pig iron made for the market by steel companies.

Pig Iron Production by Districts, Gross Tons

	April (30 days)	March (31 days)	Feb. (28 days)	Jan. (31 days)
New York and Mass.	224,933	232,561	198,877	212,856
Lehigh Valley	88,409	97,046	83,712	89,381
Schuylkill Valley	79,693	86,357	75,063	79,010
Lower Susq. and Lebanon Valleys	47,828	52,922	42,753	48,313
Pittsburgh district	713,181	725,418	604,415	654,225
Shenango Valley	127,760	127,295	100,142	105,748
Western Penna.	131,359	126,905	102,912	97,818
Maryland, Virginia and Kentucky	96,880	99,366	90,620	89,990
Wheeling district	152,155	136,116	113,632	130,872
Mahoning Valley	280,266	301,941	265,389	287,686
Central and Northern Ohio	333,866	353,977	303,080	302,339
Southern Ohio	44,762	47,567	42,189	47,160
Illinois and Indiana	690,308	661,496	534,605	553,013
Mich., Minn., Mo., Wis., Colo. and Utah	149,656	156,405	140,730	152,266
Alabama	251,401	271,097	236,786	246,536
Tennessee	9,769	6,893	5,774	6,607
Total	3,422,226	3,483,362	2,940,679	3,103,820

Daily Average Production of Coke and Anthracite Pig Iron in the United States by Months Since Jan. 1, 1922—Gross Tons

	1923	1924	1925	1926	1927
Jan.	104,181	97,384	108,720	106,974	100,123
Feb.	106,935	106,026	114,791	104,408	105,024
Mar.	113,673	111,809	114,975	111,032	112,366
Apr.	118,324	107,781	108,632	115,004	114,074
May	124,764	84,358	94,542	112,304	
June	122,548	67,541	89,115	107,844	
½ year	115,147	95,794	105,039	109,660	
July	118,656	57,577	85,936	103,978	
Aug.	111,274	60,875	87,241	103,241	
Sept.	104,184	68,442	90,873	104,543	
Oct.	101,586	79,907	97,528	107,553	
Nov.	96,476	83,656	100,767	107,890	
Dec.	94,225	95,539	104,853	99,712	
Year	109,713	85,075	99,735	107,043	

Coke Furnaces in Blast

	Total Stacks	May 1 In Blast	Capacity per Day	April 1 In Blast	Capacity per Day
Furnaces					
New York:					
Buffalo	21	12	5,565	12	5,600
Other N. Y. and Mass.	6	4	1,790	5	1,970
New Jersey	3	0	....	0	....
Pennsylvania:					
Lehigh Valley	11	6	2,670	6	2,880
Spiegeleisen	2	2	275	2	245
Schuylkill Valley	12	6	2,655	6	2,785
Susquehanna Valley	4	3	1,340	3	1,355
Spiegeleisen	1	1	675	1	75
Lebanon Valley	1	0	....	1	190
Ferromanganese	2	0	....	1	85
Pittsburgh District	52	40	23,135	40	23,200
Ferromanganese	4	1	235	1	175
Shenango Valley	13	8	3,890	8	4,105
Western Pennsylvania	18	7	3,940	7	4,075
Ferromanganese	2	2	440	2	305
Maryland	5	6	2,530	6	2,505
Ferromanganese	1	0	....	0	....
Wheeling District	13	9	4,670	9	4,485
Ohio:					
Mahoning Valley	26	15	9,040	16	9,740
Central and Northern	23	19	11,060	19	11,415
Southern	13	5	1,490	5	1,535
Illinois and Indiana	44	36	22,640	35	22,000
Mich., Wis. and Minn.	12	6	2,835	7	3,095
Colo., Mo. and Utah	7	4	1,925	4	1,950
The South:					
Virginia	15	1	210	1	245
Spiegeleisen	1	1	860	1	85
Kentucky	5	1	380	1	370
Alabama	34	22	8,300	22	8,660
Ferromanganese	1	1	80	1	85
Tennessee	12	2	325	1	220
Total	364	220	112,955	223	113,435

Production of Steel Companies for Own Use—Gross Tons

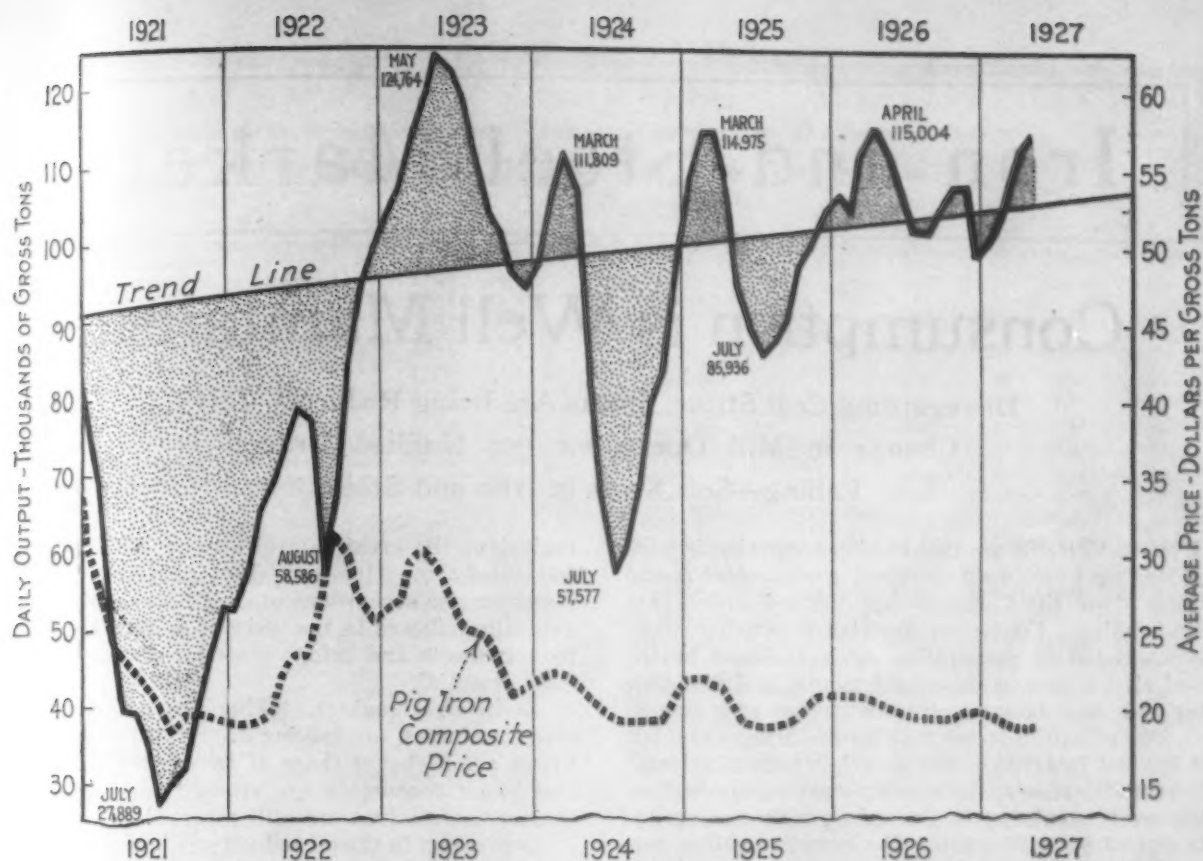
	Total Iron, Spiegel and Ferro	Spiegeleisen and Ferromanganese*
	1926	1927
Jan.	2,599,876	2,343,881
Feb.	2,272,150	2,256,651
Mar.	2,661,092	2,675,417
Apr.	2,677,094	2,637,919
May	2,687,138	23,159
June	2,465,583	25,378
½ year	15,362,933	148,173
July	2,461,161	26,877
Aug.	2,424,687	23,557
Sept.	2,436,733	25,217
Oct.	2,578,830	28,472
Nov.	2,484,620	31,903
Dec.	2,322,180	31,627
Year	30,071,144	315,828

*Includes output of merchant furnaces.

Production of Coke and Anthracite Pig Iron in United States By Months, Beginning Jan. 1, 1924—Gross Tons

	1925	1926	1927
Jan.	3,370,336	3,316,201	3,103,820
Feb.	3,214,143	2,923,415	2,940,679
Mar.	3,564,247	3,441,986	3,483,362
Apr.	3,258,958	3,450,122	3,422,226
May	2,930,807	3,481,428	
June	2,673,457	3,235,309	
½ year	19,011,948	19,848,461	
July	2,664,024	3,223,338	
Aug.	2,704,476	3,200,479	
Sept.	2,726,198	3,136,293	
Oct.	3,023,370	3,334,132	
Nov.	3,023,006	3,236,707	
Dec.	3,250,448	3,091,060	
Year*	36,403,470	39,070,470	

*These totals do not include charcoal pig iron. The 1926 production of this iron was 163,880 tons.



Daily Pig Iron Output in April 1.5 Per Cent Larger Than in March; Composite Price Increases

Inclined line represents the gradually increasing theoretical needs of the country, and shows that production is considerably above the so-called normal. Dotted line represents THE IRON AGE composite price

capacity of the 220 furnaces in operation on the first of May was 112,955 tons as against 113,435 tons per day for the 223 furnaces active on April 1.

Of the 8 furnaces shut down in April, 3 were Steel Corporation stacks, one was an independent steel company furnace and 4 were merchant. The 5 furnaces blown in during April were credited as follows: 3 to the Steel Corporation and 2 to merchant iron companies.

Manganese Alloy Output High

Ferromanganese output in April was 24,735 tons, comparing with 27,834 tons in March. This brings the monthly average for the four months to 27,243 tons as against 26,319 tons per month in all of 1926. The spiegeleisen production last month was 12,907 tons or the largest in many months. In March it was 7650 tons, with the average for the first quarter 7393 tons per month.

Furnaces Blown In and Out

The following furnaces were blown in during April: No. 2 Donora furnace of the American Steel & Wire Co. in the Pittsburgh district; the Sharpsville furnace in the Shenango Valley; No. 2 furnace of the National Tube Co. in northern Ohio; one South Chicago furnace of the Illinois Steel Co. in the Chicago district and the Johnson City furnace in Tennessee.

Furnaces which were blown out or banked during April included the Genesee furnace of M. A. Hanna Co. in New York; the Robeson and Sheridan furnaces in the Lebanon Valley; No. 2 Carrie furnace of the Carnegie Steel Co. in the Pittsburgh district; No. 4 Newcastle furnace of the Carnegie Steel Co. in the Shenango Valley; No. 5 Haselton furnace of the Republic Iron & Steel Co. in the Mahoning Valley; No. 5 furnace of the National Tube Co. in northern Ohio, and the Zenith furnace in Minnesota.

Open-Hearth Furnace Meeting at Buffalo

BUFFALO, May 3.—Fifty open-hearth operating men at the Hotel Statler today discussed sloping backwalls, suspended flat and arched roofs, the relations of sectional areas of hearth ports, flues, checkers and stack, the method of laying checkers and type of brick desirable, insulation of flues and checkers, turboblowers, and the use of the dolomite gun for making furnace bottom.

One sloping backwall was reported for which 600 heats were taken without repairs being needed. It must have a slope equivalent to the angle of repose of the bottom materials. A suspended flat roof 7 ft. above the bath made 418 heats a little faster than regular roof. It was emphasized that it is necessary to strike the economic balance for the life of an expensive roof between consumption of fuel and the time of making a heat.

The new chairman is L. F. Reinartz, American Rolling Mill Co., Middletown. The secretary is James J. Bowden, metallurgist Columbia Steel Co., Butler, Pa.

Gain in Employment in Metal Trades

Employment in shops affiliated with the National Metal Trades Association, Chicago, showed a gain in March, which was the fourth consecutive increase since November, 1926. The total number of employees in March was 622,503, as compared with 615,179 in February. Shops in New England, Ohio, Indiana, Michigan, Illinois, Wisconsin and Iowa reported gains, but a small loss was reported by the district comprising New York, New Jersey, Pennsylvania and Maryland. The March total falls short of that for the same month in 1926, when 656,731 operatives were reported employed.

Iron and Steel Markets

Consumption is Well Maintained

Disregarding Coal Strike, Stocks Are Being Reduced—Little
Change in Mill Operations but Unfilled Orders
Falling—Soft Spots in Iron and Steel

INDICATIONS are that steel consumption is holding up to the rate of recent weeks. Mill operations show little change but unfilled orders are diminishing. Consumers have taken to using stocks accumulated in preparation against checks by the coal strike, now in its second month, and discounting this as a factor again are buying very closely.

The situation is not making for firm prices, but it has not interfered with a rather general attempt to establish sheets, the notably weak commodity, on the levels obtaining in December, representing advances of \$2 to \$6 a ton. The immediate effect has been the closing of specifications on tonnage outstanding and the passing of the extremely low quotations.

April, as was the case last year, proved to be the peak month in pig iron production, just as March was in steel in the two years. The output, 3,422,226 tons, represented a daily rate of 114,074 tons, or 1½ per cent more than March. The gain of 1708 tons per day was made except for 82 tons by steel company furnaces.

The month ended with 220 furnaces out of 364 in blast, three less than on April 1. The rate of production on May 1 was 112,955 tons a day. Both February and March had shown outputs greater than the corresponding months of 1926, while April was below April a year ago by less than 1 per cent. On May 1, 1926, however, there were 237 furnaces active at a 115,150-ton daily rate, but the decline in May was rather rapid. Of the furnaces now in operation, there are 2 less merchant and 1 less independent steel company stacks than a month ago.

Pittsburgh district steel makers no longer regard it a necessary strike measure to husband stocks of basic pig iron and have made sales at \$18.50, Valley furnace, a reduction of 50c. a ton. Consumer interest in pig iron is on a diminishing scale. Tennessee foundry iron, unable to hold its recent advance, has receded to \$18, base Birmingham, the common price on Alabama iron.

So well are consumers supplied, that prices of both coal and coke are suffering, and furnace coke has declined 15c. to \$3 a ton, Connellsville.

Heavy melting steel scrap has declined 50c. a ton at Pittsburgh, the second reduction in two weeks. The same grade has dropped 25c. a ton at Cleveland and Chicago and 75c. at Cincinnati.

Reconstruction of the pig iron rate structure in Central Freight Association territory, effective May 30, will mean both advances and reductions, although the new rates are said to average 10 per cent lower than those in effect on July 1, 1922.

The stoppage of distribution to the flood stricken

regions of the great central area of the country is felt chiefly by wire and sheet producers. Additional emergency orders of track accessories have naturally followed in the wake of destruction, while roofing sheets and bridge material will shortly become essential.

Strip steel makers, taking the cue from the sheet producers, are talking of trying for advances. Prices are \$4 below those of December; yet seeing that many consumers are covered for the second quarter, concessions are still reported.

Depression in the oil industry is held responsible in part for steel makers' turning to supplying semi-finished steel. One result is a reduction of \$1 a ton in forging billets and, in Chicago, of \$1 to \$1.50 in wire rods.

Following considerable selling of wire nails to jobbers at \$2.40 a keg, Pittsburgh basis, the market is now quoted at \$2.50.

The Illinois Central has now definitely come into the market for 4500 freight cars, also for 15 locomotives, and the Erie is asking for bids on 50 engines. The Chicago & Illinois Midland is inquiring for 350 cars. An Eastern railroad has placed 10,000 tons of rails at Chicago.

Structural steel bookings for the week called for 33,000 tons, and inquiries for nearly 20,000 tons. No marked betterment in fabricated steel prices is discernible.

The Pittsburgh Steamship Co. is inquiring for two freighters requiring 10,000 tons of hull steel, supplementing two now being built.

Bolt and nut buyers taking a wide range of sizes are offering little or no opposition to the revised price schedules, but users of the larger bolts, which were advanced under the new lists, are slow in purchasing.

Crowded by competition of Norwegian ferro-manganese in European markets, British makers have reduced their selling price here \$5 a ton, now quoting \$95, seaboard, without guarantee against further decline. American makers met the cut, thus affecting considerable unshipped first half tonnage, on which buyers have protection against a decline. The lower prices have brought no additional business.

Germany's domestic steel business is expanding so much, chiefly for construction of buildings and ships, that producers are ignoring foreign markets. Its March output of rolled steel was the largest for any month since the war. Expansion in shipbuilding is reported also from Great Britain.

THE IRON AGE pig iron composite price has fallen to \$19.13 per gross ton from \$19.21 last week. The composite price for finished steel remains at 2.339c.

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics
At Date, One Week, One Month, and One Year Previous

Pig Iron, Per Gross Ton:	May 3, 1927	Apr. 26, 1927	Apr. 5, 1927	May 4, 1926
No. 2 fdy., Philadelphia...	\$21.76	\$21.76	\$21.76	\$22.76
No. 2 Valley furnace.....	18.50	18.50	18.50	19.00
No. 2 Southern, Cin'ti....	21.69	21.69	21.69	25.69
No. 2, Birmingham.....	18.00	18.00	18.00	22.00
No. 2 foundry, Chicago*...	20.00	20.00	20.00	22.00
Basic, del'd eastern Pa....	20.75	20.75	20.75	21.75
Basic, Valley furnace.....	18.50	19.00	19.00	18.50
Valley Bessemer, del'd P'gh.	21.26	21.26	21.26	21.26
Malleable, Chicago*.....	20.00	20.00	20.00	22.00
Malleable, Valley.....	18.50	18.50	18.50	19.00
Gray forge, Pittsburgh....	19.76	19.76	19.76	20.26
L. S. charcoal, Chicago....	27.04	27.04	27.04	29.04
Ferromanganese, furnace..	95.00	100.00	100.00	88.00

Rails, Billets, etc., Per Gross Ton:	May 3, 1927	Apr. 26, 1927	Apr. 5, 1927	May 4, 1926
O-h. rails, heavy, at mill.	\$43.00	\$43.00	\$43.00	\$43.00
Light rails at mill.....	36.00	36.00	36.00	32.00
Bess. billets, Pittsburgh...	33.00	33.00	34.00	35.00
O-h. billets, Pittsburgh...	33.00	33.00	34.00	35.00
O-h. sheet bars, P'gh.....	34.00	34.00	34.00	36.00
Forging billets, P'gh.....	39.00	40.00	40.00	40.00
O-h. billets, Phila.....	39.30	39.30	39.30	40.30
Wire rods, Pittsburgh....	42.00	42.00	43.00	45.00
Skelp, grvd. steel, P'gh, lb.	1.90	1.90	1.90	1.90

Finished Iron and Steel, Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Iron bars, Philadelphia...	2.12	2.12	2.12	2.22
Iron bars, Chicago.....	2.00	2.00	2.00	2.00
Steel bars, Pittsburgh...	1.85	1.85	1.90	2.00
Steel bars, Chicago.....	2.00	2.00	2.00	2.10
Steel bars, New York....	2.19	2.19	2.24	2.34
Tank plates, Pittsburgh...	1.85	1.85	1.85	1.90
Tank plates, Chicago.....	2.00	2.00	2.00	2.10
Tank plates, New York....	2.19	2.19	2.19	2.24
Beams, Pittsburgh.....	1.80	1.80	1.90	1.90
Beams, Chicago.....	2.00	2.00	2.00	2.10
Beams, New York.....	2.14	2.14	2.19	2.24
Steel hoops, Pittsburgh...	2.30	2.30	2.30	2.50

*The average switching charge for delivery to foundries in the Chicago district is 61c. per ton.

On export business there are frequent variations from the above prices. Also, in domestic business, there is at times a range of prices on various products, as shown in our market reports on other pages.

Sheets, Nails and Wire, Per Lb. to Large Buyers:	May 3, 1927	Apr. 26, 1927	Apr. 5, 1927	May 4, 1926
Sheets, black, No. 24, P'gh	2.70	2.70	2.75	3.10
Sheets, black, No. 24, Chi-				
cago dist. mill.....	2.95	2.95	2.95	3.20
Sheets, galv., No. 24, Pitts-				
burgh.....	3.60	3.60	3.65	4.05
Sheets, galv., No. 24, Chi-				
cago dist. mill.....	3.85	3.85	3.85	4.25
Sheets, blue, 9 & 10, P'gh	2.15	2.15	2.20	2.40
Sheets, blue, 9 & 10, Chi-				
cago dist. mill.....	2.35	2.35	2.35	2.60
Wire nails, Pittsburgh....	2.50	2.55	2.55	2.65
Wire nails, Chicago dist.				
mill.....	2.60	2.60	2.60	2.70
Plain wire, Pittsburgh....	2.40	2.40	2.40	2.50
Plain wire, Chicago dist.				
mill.....	2.45	2.45	2.45	2.55
Barbed wire, galv., P'gh..	3.25	3.25	3.25	3.35
Barbed wire, galv., Chi-				
cago dist. mill.....	3.30	3.30	3.30	3.40
Tin plate, 100 lb. box, P'gh	\$5.50	\$5.50	\$5.50	\$5.50

Old Material, Per Gross Ton:	May 3, 1927	Apr. 26, 1927	Apr. 5, 1927	May 4, 1926
Carwheels, Chicago.....	\$14.25	\$14.75	\$15.25	\$15.50
Carwheels, Philadelphia...	16.00	16.00	16.00	17.50
Heavy melting steel, P'gh..	15.50	16.00	16.75	16.00
Heavy melting steel, Phila.	14.50	14.50	14.50	15.50
Heavy melting steel, Ch'go	12.75	13.00	13.25	12.25
No. 1 cast, Pittsburgh....	16.00	16.00	16.00	16.50
No. 1 cast, Philadelphia...	17.00	17.00	17.00	17.50
No. 1 cast, Ch'go (net ton)	16.50	16.50	16.50	16.00
No. 1 RR. wrot., Phila....	16.50	16.50	16.50	17.50
No. 1 RR. wrot., Ch'go, (net)	11.75	12.25	12.50	11.25

Coke, Connellsville, Per Net Ton at Oven:	May 3, 1927	Apr. 26, 1927	Apr. 5, 1927	May 4, 1926
Furnace coke, prompt....	\$3.00	\$3.15	\$3.25	\$3.00
Foundry coke, prompt....	4.00	4.00	4.25	4.00

Metals, Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Lake copper, New York...	13.12 1/2	13.25	13.25	14.00
Electrolytic copper, refinery	12.75	12.87 1/2	12.87 1/2	13.62 1/2
Zinc, St. Louis.....	6.12 1/2	6.10	6.55	6.70
Zinc, New York.....	6.47 1/2	6.45	6.90	7.05
Lead, St. Louis.....	6.40	6.57 1/2	7.00	7.60
Lead, New York.....	6.75	6.87 1/2	7.25	7.85
Tin (Strait), New York.	67.00	66.75	69.75	63.25
Antimony (Asiatic), N. Y.	13.00	14.75	13.50	12.50

Pittsburgh

Basic Pig Iron, Scrap and Coke Decline— Steel Output Recedes as Demand Contracts

PITTSBURGH, May 3.—April proved a good operating month, with an average output for this and nearby districts of approximately 80 per cent of ingot capacity and with shipments well up to that rate, but this activity was largely on the momentum of March and at the expense of order books, since new business has been generally lighter than the movement of steel from the mills. Ingot production this week is slightly below 80 per cent in this and nearby districts. Roughly, it is off 12 points from the March rate, and the tendency is still down, because the coal strike, which some had expected would begin to be felt by this time, is absolutely devoid of market influence and whether it is coal, iron or steel, the tendency is strong to use up reserves acquired as a precautionary measure.

The depression in the oil industry, due to overproduction, is more far-reaching in its effect upon the steel industry than in merely curtailing the demand for oil well pipe. It has given several pipe producers and other steel companies which served pipe manufacturers surplus steel for other uses, and just now there is more semi-finished steel than can be readily marketed. If consumers were interested, there is not much doubt that they could buy for less than the quoted prices.

The steel market in general is soft. In the heavy tonnage products, prices seem to be reasonably well maintained in the territory controlled by Pittsburgh mills through freight advantages, but this area cannot

consume the production of the companies within it and recourse is necessary to the more competitive consuming territories.

Sheet makers have generally followed the advances announced late last week by the Youngstown Sheet & Tube Co., amounting to from \$2 to \$6 a ton over former ruling prices. All mills, however, do not seem to have made the advance immediately effective. An effort to secure higher prices for cold-rolled strips is seen in the adoption by one maker of a plan tried out before of making the base price apply on 1 to 3 tons, with graduated discounts down for lots of 18 tons or more. As a rule, however, the desire for business is a little too strong for prices to be entirely unyielding.

The steel companies seem to have concluded that there is no immediate danger of a shortage of coke or a demand for steel that necessitates a large stock of basic pig iron, and sales in the past week from their stocks are responsible for a drop of 50c. a ton in that grade and for an unsettling of the market on other grades. There is no consumer interest in scrap and little on the part of dealers, who have fairly well covered their short sales, with the result that prices have had a further decline of 50c. a ton to the lowest point in almost a year.

Coal production, even with union mines almost entirely idle, is running almost up to the average of this time last year and the year before. With consumers generally well stocked, the offerings exceed the demand and prices are low, weak and unprofitable, despite the fact that the coal is being produced at wage scales one-quarter to one-third less than the so-called union rates. Coke likewise is a drug on the market and easily obtainable at \$3 for furnace grade.

Pig Iron.—It has been pointed out from time to time that the prices recently established were not the result of any shortage of supplies, but were due to a

disinclination on the part of producers to sell until they saw how the coal strike was going to work out. This view has been confirmed by the developments of the past week, when steel companies became satisfied that if there is going to be a shortage of coal or coke as a result of the suspension of union mines, it is not in sight. Consequently, they have been more willing to part with some of their stocks. Basic iron is down 50c. a ton at Valley furnaces on a transaction involving 2000 tons, and an even lower Valley equivalent price was made on a 5000-ton lot, taken by a Pittsburgh district steel foundry from a Pittsburgh district steel company, which went at \$18.50, furnace, with a freight rate to destination of \$1.13, compared with \$1.76 from Valley furnaces. The difference in freight would mean that Valley furnaces would have had to go to \$17.87 to get the business on even terms. Other grades are quotable at last week's prices, but only carload lots are being moved and now that the steel companies have begun selling surplus stocks of basic iron, there is a threat of competition in the other grades for the merchant producers. The sales of basic iron at \$18.50, Valley furnace, are recognized in the April average price of basic iron of W. P. Snyder & Co., which is \$18.73, as compared with a quotation over most of the month of \$19. The Bessemer average was \$19.50. In March the basic average was \$18.50 and that of Bessemer, \$19.39.

Prices per gross ton f.o.b. Valley furnace:

Basic	\$18.50
Bessemer	19.50
Gray forge	\$18.00 to 18.50
No. 2 foundry	18.50 to 19.00
No. 3 foundry	18.00 to 18.50
Malleable	18.50 to 19.00
Low phosphorus, copper free....	28.00

Freight rate to the Pittsburgh or Cleveland district, \$1.76.

Hot-Rolled Flats.—April business fell as much as 25 per cent below that of March with strip makers in this and nearby districts, but the falling away in business seems to have been generally expected following the heavy demand of March and has not disturbed producers to the extent of making them want more tonnage at the expense of prices. Some interest in third quarter tonnages should begin to develop after the middle of the month, and the test of present prices will then be provided, since only on small tonnages and in a few cases have present prices been paid. Consumers generally were covered for this quarter before prices advanced toward the close of February.

Ferroalloys.—British producers of ferromanganese, as of April 27, announced a reduction of \$5 a ton to \$95, c.i.f. Atlantic seaboard, duty paid, with no guarantee against a decline, for 80 per cent material for shipment over the remainder of this year. This reduction was immediately met by domestic producers, who made the cut effective from April 27, applying against unshipped or unspecified tonnages. This step was necessary in view of the clause in contracts guaranteeing buyers against a decline or permitting cancellation in the event that buyers could buy elsewhere for less than the contract price. The lower price has brought no business to either domestic or foreign

makers. The larger consumers are covered by contract to July 1, and as usually is the case following a price reduction, they are waiting to see if this is the only concession that will be made. The drop in the price of the British material came with considerable suddenness, but is not a complete surprise in view of the fact that Norwegian ferromanganese has been offered well under the British price in France and the break abroad has made possible British offerings in American markets without the danger of the invoking of the anti-dumping law. Spot demand for spiegeleisen is very light and is not hard to satisfy even with a comparatively limited supply. Contract customers are specifying steadily for that material and also for high grade ferrosilicon. Prices are given on page 1325.

Semi-Finished Steel.—Makers are not satisfied with the prices they are getting for billets, slabs and sheet bars, but there is not enough demand to sustain an effort to get more. Strip steel orders are not so heavy that makers find it necessary to urge shipments of billets and slabs, and the demand for sheets and tin plate is not so pressing that non-integrated producers have to increase their specifications. Mills here are still quoting \$33 for large billets and slabs and \$34 for sheet bars and small billets and slabs, but supplies are readily available at those prices, as are wire rods at \$42. to \$43, base, skelp at 1.90c. and forging quality billets at \$40. Indeed, forging billets have sold at \$39.

Steel and Iron Bars.—In this immediate area mills still are able to get 1.90c. for ordinary tonnages of steel bars down to single carloads, but going east or west of the favorable freight zone, it is necessary to go \$1 a ton lower to get orders in competition with outside mills and they are making that concession to retain desirable connections. Orders and specifications for steel bars continue to recede, but the decline is gradual rather than sharp, and the greatest complaint is not over the size of the orders but regarding the fact that consumers are buying so close to their real needs and mill scheduling more than a week ahead is difficult. Iron bars are dull and easy.

Structural Steel.—Ordinary tonnages of large structural shapes are still going at 1.90c., base Pittsburgh, in the area in which Pittsburgh mills have a freight advantage over outside mills, but beyond the limits of that territory prices are competitive and on the desirable tonnages, buyers seem able to dictate the terms to the mills. Structural lettings for the year to date make a favorable comparison with the same period last year, but the total includes a number of large individual jobs, which seem to have gone to a few companies. Hence the lettings alone do not give a true picture of the fabricating industry as a whole. The real situation is that a few are busy and many are in need of business, which means keen competition on the jobs coming before the market. A project in New York State calling for only 1000 tons recently brought out a delivered price of \$62.50 per ton. Pittsburgh has a good deal of construction in sight, but it is not moving toward fabricating shops and the mills.

Plates.—Prices are steadier in this product than in

THE IRON AGE Composite Prices

Finished Steel

May 3, 1927, 2.339c. a Lb.

One week ago.....	2.339c.
One month ago.....	2.367c.
One year ago.....	2.439c.
10-year pre-war average.....	1.689c.

Based on steel bars, beams, tank plates, plain wire, open-hearth rails, black pipe and black sheets. These products constitute 87 per cent of the United States output of finished steel.

High			Low		
1927	2.453c.	Jan. 4;	2.339c.	April 26	
1926	2.453c.	Jan. 5;	2.403c.	May 18	
1925	2.560c.	Jan. 6;	2.396c.	Aug. 18	
1924	2.789c.	Jan. 15;	2.460c.	Oct. 14	
1923	2.824c.	April 24;	2.446c.	Jan. 2	

Pig Iron

May 3, 1927, \$19.13 a Gross Ton

One week ago.....	\$19.21
One month ago.....	19.21
One year ago.....	20.88
10-year pre-war average.....	15.72

Based on average of basic iron at Valley furnace and foundry irons at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

High			Low		
1927	\$19.71.	Jan. 4;	\$18.96.	Feb. 15	
1926	21.54.	Jan. 5;	19.46.	July 13	
1925	22.50.	Jan. 13;	18.96.	July 7	
1924	22.88.	Feb. 26;	19.21.	Nov. 3	
1923	30.86.	March 20;	20.77.	Nov. 20	

Mill Prices of Finished Iron and Steel Products

Iron and Steel Bars Soft Steel

	Base Per Lb.
F.o.b. Pittsburgh mills.....	1.85c. to 1.90c.
F.o.b. Chicago.....	2.00c. to 2.10c.
Del'd Philadelphia.....	2.17c. to 2.22c.
Del'd New York.....	2.19c. to 2.24c.
Del'd Cleveland.....	2.09c.
F.o.b. Cleveland.....	1.90c.
F.o.b. Birmingham.....	2.06c. to 2.15c.
F.o.b. Pacific ports.....	2.35c.
F.o.b. San Francisco mills.....	2.35c. to 2.40c.

Billet Steel Reinforcing

F.o.b. Pittsburgh mills.....	1.90c.
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Rail Steel

F.o.b. mill.....	1.75c. to 1.80c.
F.o.b. Chicago.....	1.90c. to 2.00c.

Iron

Common iron, f.o.b. Chicago.....	2.00c.
Refined iron, f.o.b. P'gh mills.....	2.75c.
Common iron, del'd Philadelphia.....	2.12c. to 2.22c.
Common iron, del'd New York.....	2.14c. to 2.24c.
C.I.F. Pacific ports.....	2.25c. to 2.30c.

Tank Plates

	Base Per Lb.
F.o.b. Pittsburgh mill.....	1.80c. to 1.90c.
F.o.b. Chicago.....	2.00c. to 2.10c.
F.o.b. Birmingham.....	1.95c. to 2.05c.
Del'd Cleveland.....	2.09c.
Del'd Philadelphia.....	2.12c. to 2.22c.
Del'd New York.....	2.14c. to 2.24c.
C.I.F. Pacific ports.....	2.25c. to 2.30c.

Structural Shapes

	Base Per Lb.
F.o.b. Pittsburgh mills.....	1.80c. to 1.90c.
F.o.b. Chicago.....	2.00c. to 2.10c.
F.o.b. Birmingham.....	2.06c. to 2.15c.
Del'd Cleveland.....	2.09c.
Del'd Philadelphia.....	2.07c. to 2.22c.
Del'd New York.....	2.09c. to 2.24c.
C.I.F. Pacific ports.....	2.25c. to 2.35c.

Hot-Rolled Flats (Hoops, Bands and Strips)

	Base Per Lb.
All gages, narrower than 6 in., P'gh.....	2.30c.
All gages, 6 in. to 12 in., P'gh.....	2.10c.
Nos. 13 and 14 gage, 12 in. to 14 in., P'gh, net.....	2.30c.
Nos. 15 and 16 gage, 12 in. to 14 in., P'gh, net.....	2.40c.
All gages, narrower than 6 in., Chicago, net.....	2.40c. to 2.60c.
All gages, 6 in. and wider, Chicago, net.....	2.30c. to 2.50c.

*Mills follow plate or sheet prices according to gage on wider than 14 in.

Cold-Finished Steel

	Base Per Lb.
Bars, f.o.b. Pittsburgh mills.....	2.40c.
Bars, f.o.b. Chicago.....	2.40c.
Bars, Cleveland.....	2.35c.
Shafting, ground, f.o.b. mill.....	2.55c. to 3.00c.
Strips, f.o.b. Pittsburgh mills.....	3.00c.
Strips, f.o.b. Cleveland mills.....	3.00c.
Strips, delivered Chicago.....	3.30c. to 3.55c.

*According to size.

Wire Products

(To jobbers in car lots, f.o.b. Pittsburgh and Cleveland)

	Base Per Keg
Wire nails.....	\$2.50 to \$2.55
Galv'd nails.....	4.55
Galvanized staples.....	3.25
Polished staples.....	3.00
Cement coated nails.....	2.55

Base Per 100 Lb.

Bright plain wire, No. 9 gage.....	\$2.49
Annealed fence wire.....	2.55
Spring wire.....	3.40
Galv'd wire, No. 9.....	3.00
Barbed wire, galv'd.....	3.25
Barbed wire, painted.....	3.00

Chicago district mill and delivered Chicago prices are \$1 per ton above the foregoing. Birmingham mill prices \$3 a ton higher; Worcester, Mass., mill \$3 a ton higher on production of that plant; Duluth, Minn., mill \$2 a ton higher; Anderson, Ind., \$1 higher.

Woven Wire Fence

	Base to Retailers Per Net Ton
F.o.b. Pittsburgh.....	\$65.00
F.o.b. Cleveland.....	65.00
F.o.b. Anderson, Ind.....	66.00
F.o.b. Chicago district mills.....	67.00
F.o.b. Duluth.....	68.00
F.o.b. Birmingham.....	68.00

Sheets

Blue Annealed

	Base Per Lb.
Nos. 9 and 10, f.o.b. Pittsburgh.....	2.15c. to 2.25c.
Nos. 9 and 10, f.o.b. Chicago dist. mill.....	2.35c. to 2.45c.
Nos. 9 and 10, del'd Philadelphia.....	2.47c. to 2.57c.
Nos. 9 and 10, f.o.b. Birmingham.....	2.35c. to 2.45c.

Box Annealed, One Pass Cold Rolled

No. 24, f.o.b. Pittsburgh.....	2.70c. to 3.00c.
No. 24, f.o.b. Ch'go dist. mill.....	2.95c. to 3.06c.
No. 24, del'd Philadelphia.....	3.02c. to 3.32c.
No. 24, f.o.b. Birmingham.....	3.10c. to 3.20c.

Metal Furniture Sheets

No. 24, f.o.b. Pittsburgh, A grade.....	3.80c. to 4.10c.
No. 24, f.o.b. Pittsburgh, B grade.....	3.70c. to 4.00c.

Galvanized

No. 24, f.o.b. Pittsburgh.....	3.60c. to 3.85c.
No. 24, f.o.b. Chicago dist. mill.....	3.85c. to 3.95c.
No. 24, del'd Philadelphia.....	3.92c. to 4.17c.
No. 24, f.o.b. Birmingham.....	3.90c. to 4.00c.

Tin Mill Black Plate

No. 28, f.o.b. Pittsburgh.....	3.90c. to 3.10c.
No. 28, f.o.b. Chicago dist. mill.....	3.10c. to 3.20c.

Automobile Body Sheets

No. 20, f.o.b. Pittsburgh.....	4.15c. to 4.25c.
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Long Ternes

No. 24, 8-lb. coating, f.o.b. mill.....	4.10c. to 4.30c.
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Tin Plate

	Per Base Box
Standard cokes, f.o.b. P'gh district mills.....	\$5.50
Standard cokes, f.o.b. Gary and Elwood, Ind.....	5.60

Terne Plate

(F.o.b. Morgantown or Pittsburgh)
(Per package, 20 x 28 in.)

8-lb. coating, 100 lb. base.....	\$11.40
8-lb. coating I.C. 11.70	30-lb. coating I.C. 19.45
15-lb. coating I.C. 14.35	40-lb. coating I.C. 21.65

Alloy Steel Bars

(F.o.b. Pittsburgh or Chicago)

S. A. E.
Series
Numbers

Base Per 100 Lb.

2100* (1/2% Nickel, 0.10% to 0.20% Carbon).....	\$3.90 to \$3.15
2300 (3/4% Nickel).....	4.30 to 4.40
2500 (5% Nickel).....	5.50
3100 (Nickel Chromium).....	3.20 to 3.40
3200 (Nickel Chromium).....	4.75 to 5.00
3300 (Nickel Chromium).....	7.00 to 7.25
3400 (Nickel Chromium).....	6.25 to 6.50
5100 (Chromium Steel).....	3.30 to 3.40
5200* (Chromium Steel).....	7.00 to 7.50
6100 (Chrom. Vanadium bars).....	4.20 to 4.30
6100 (Chrom. Vanad. spring steel).....	3.80
9250 (Silicon Manganese spring steel).....	3.20 to 3.25
Carbon Vanadium (0.45% to 0.55% Carbon, 0.15% Vanad.).....	4.10 to 4.20
Nickel Chrome Vanadium (0.60 Nickel, 0.50 Chrom., 0.15 Vanad.).....	4.20 to 4.30
Chromium Molybdenum bars (0.50—1.10 Chrom., 0.25—0.40 Molyb.).....	4.25 to 4.35
Chromium Molybdenum bars (0.50—0.70 Chrom., 0.15—0.25 Molyb.).....	3.40 to 3.50
Chromium Molybdenum spring steel (1—1.25 Chrom., 0.30—0.50 Molybdenum).....	4.50 to 4.75

Above prices are for hot-rolled steel bars, forging quality. The ordinary differential for cold-drawn bars is 1c. per lb. higher. For billets 4 x 4 to 18 x 18 in. the price for a gross ton is the net price for bars of the same analysis. For billets under 4 x 4 in. down to and including 2 1/2 in. squares, the price is \$5 a gross ton above the 4 x 4 billet price.

*Not S. A. E. specification, but numbered by manufacturers to conform to S. A. E. system.

Rails

	Per Gross Ton
Standard, f.o.b. mill.....	\$43.00
Light (from billets), f.o.b. mill.....	36.00
Light (from rail steel), f.o.b. mill.....	34.00
Light (from billets), f.o.b. Ch'go mill.....	\$36.00 to \$5.00

Track Equipment (F.o.b. Mill)

	Base Per 100 Lb.
Spikes, 1/2 in. and larger.....	\$2.90 to \$3.00
Spikes, 1/2 in. and smaller.....	2.80 to 3.15
Spikes, boat and barge.....	3.25
Tie plates, steel.....	2.35
Angle bars.....	2.75
Track bolts, 1 1/2 in. and 1 in.....	3.90 to 4.00
Track bolts, 3/4 in. and smaller, per 100 count.....	.70 per cent off list

Welded Pipe

Base Discounts, f.o.b. Pittsburgh District and Lorain, Ohio, Mills

Butt Weld			Lap Weld		
Inches	Steel	Black Galv.	Inches	Iron	Black Galv.
1/2	45	19 1/2	1/2	22	11
3/4	51	25 1/2	3/4	22	11
1	56	32 1/2	1	28	11
1 1/4	60	38 1/2	1 1/4	30	13
1 1/2	62	40 1/2			
2	55	48 1/2	2	23	7
2 1/2	59	47 1/2	2 1/2	26	11
3	56	43 1/2	3	28	13
3 1/2	54	41 1/2	3 1/2	26	11
4	53	40 1/2			

Butt Weld, extra strong, plain ends

1/2	41	24 1/2	1/2	19	11
3/4	47	30 1/2	3/4	21	17
1	53	37 1/2	1	28	12
1 1/4	58	44 1/2	1 1/4	30	14
1 1/2	60	46 1/2			
2	61	50 1/2			

Lap Weld, extra strong, plain ends

2	53	42 1/2	2	23	9
2 1/2	57	46 1/2	2 1/2	29	15
3	56	45 1/2	3	28	14
3 1/2	52	39 1/2	3 1/2	21	15
4	45	32 1/2	4	16	2
4 1/2	44	31 1/2			

To the large jobbing trade the above discounts on steel pipe are increased on black by one point, with supplementary discount of 5%, and on galvanized by 1 1/2 points, with supplementary discount of 5%. On iron pipe, both black and galvanized, the above discounts are increased to large jobbers by one point with supplementary discounts of 5 and 2 1/2%.

Note.—Chicago district mills have a base two points less than the above discounts. Chicago delivered base is 2 1/2 points less. Freight is figured from Pittsburgh, Lorain, Ohio, and Chicago district mills, the billing being from the point producing the lowest price to destination.

Boiler Tubes

Base Discounts, f.o.b. Pittsburgh

Lap Welded Steel		Charcoal Iron	
2 to 2 1/2 in.....	27	1 1/2 in.....	+18
2 1/2 to 3 in.....	37	1 1/2 to 1 3/4 in.....	+8
3 in.....	40	2 to 2 1/4 in.....	2
3 1/2 to 3 3/4 in.....	42 1/2	2 1/4 to 3 in.....	7
4 to 13 in.....	46	3 1/4 to 4 1/4 in.....	9

Beyond the above discounts, 5 to 7 five extra are given on lap welded steel tubes and 2 tens to 2 tens and 1 five on charcoal iron tubes.

Standard Commercial Seamless Boiler Tubes

Cold Drawn		Hot Rolled	
1 in.....	60	3 in.....	45
1 1/2 to 1 3/4 in.....	52	3 1/2 to 3 3/4 in.....	47
1 3/4 in.....	36	4 in.....	50
2 to 2 1/4 in.....	31	4 1/2, 5 and 6 in.....	45
2 1/4 to 2 3/4 in.....	39		

2 and 2 1/4 in.....	37	3 1/2 and 3 3/4 in.....	53
2 1/2 and 2 3/4 in.....	45	4 in.....	54
3 in.....	51	4 1/2, 5 and 6 in.....	51

Less carloads, 4 points less. Add 28 per net ton for more than four gages heavier than standard. No extra for lengths up to and including 24 ft. Sizes smaller than 1 in. and lighter than standard gage to be held at mechanical tubes list and discount. Intermediate sizes and gages not listed take price of next larger outside diameter and heavier gage.

Seamless Mechanical Tubing

	Per Cent Off List
Carbon, 0.10% to 0.30%, base.....	55
Carbon, 0.30% to 0.40%, base.....	50
Plus differentials for lengths over 18 ft. and for commercially exact lengths. Warehouse discounts on small lots are less than the above.	

bars and shapes, but they are so low in relation to costs that sales pressure is light. Bids will be opened around the middle of the month for 37 river barges, which will take 4600 tons of steel, and meanwhile large pipe for gas lines is providing a good amount of plate business. Ordinary tonnages are selling at 1.85c. to 1.90c., with the large-lot buyers getting supplies at 1.80c.

Wire Products.—The movement into consumption is still good, and there is a constant demand upon the mills for supplies which jobbers failed to stock in anticipation of the spring demand. Prices are steady in most markets and on most products. The price situation is a little uncertain on nails in some markets.

Rails and Track Supplies.—Both large and small spikes are now quoted at \$2.80, base per 100 lb., f.o.b. Pittsburgh. Full adherence to a differential of 10c. per 100 lb. on small spikes has been lacking for several weeks, but now all makers are quoting both sizes at the same base. There is not much activity in the track accessories, and good-sized shipments in April seem to have cut heavily into order books. The movement of standard-section rails continues to taper, and the demand for light-section rails is light because of the depressed market in coal, which is discouraging to mine operations.

Tubular Goods.—Some quickening is reported in the demand for standard-weight pipe, but it still lacks the volume it usually attains at this time of the year, when building construction activity is heavy. The gas companies are taking a fair amount of well pipe in addition to line pipe, but the demand from the oil industry is still subnormal because of overproduction and low and unprofitable prices. There is some demand for pipe for oil wells, as some drilling has to go on and pipe is also needed for offsetting wells. Some mills lately have been getting a fair amount of business from Florida, where prospecting is active. The railroads are taking a fair amount of boiler tubes, and there is a moderately good movement of mechanical tubing to the automotive industry. Intimations are beginning to be heard of less rigid observance of pipe discounts, which have been in effect for a little more than four years.

Sheets.—Nearly all of the larger producers have followed the lead of the Youngstown Sheet & Tube Co. in announcing prices of 3c., base Pittsburgh, for black, 3.85c., base, for galvanized and 2.25c., base, for blue annealed sheets, while those making automobile body sheets have announced 4.25c., base. The largest individual sheet maker has not yet acted but will probably go along with the advance, which as compared with recent minimum prices represents an increase of \$2 a ton in automobile body sheets and from \$4 to \$6 a ton in the common finishes. In announcing the new prices, makers generally stated that they were immediately effective, but there are instances where mills have given their customers a few days of grace at the former prices. With those mills, the effort to get higher

prices is virtually nullified at the start, but generally the mills were rather well down in order books at the time of the announcement of the advance. The American Sheet & Tin Plate Co. last week operated at 80 per cent of capacity, and that is close to the industry average, as independent companies also ran at about 80 per cent last week.

Tin Plate.—The American Sheet & Tin Plate Co. is getting some specifications against July shipments of tin plate but as yet has made no price for the quarter and half-year beginning July 1. It is merely a guess, although probably a good one, that the price for last half will be same as it has been for the first half of this year. New business is slow, and specifications against contracts are not so heavy as they were earlier in the year. The common expectation is that tin plate production will run about 10 per cent under that of 1926, because of the drive against a full pack of those vegetables of which there is a considerable surplus from the 1926 pack.

Cold-Finished Steel Bars and Shafting.—April was a good shipping month, but was not productive of as much new business as March, and May starts with most makers having comparatively light order books. Prices are steady at 2.40c., base Pittsburgh, for ordinary tonnages, and that price is not being shaded by more than \$2 a ton even to the very large buyers.

Cold-Rolled Strips.—Business has had a very material recession in the past month from that of the month before, due chiefly to the paucity of demand from the automotive industry. On new business, makers generally are holding to 3c., base, for carloads, f.o.b. Pittsburgh, with freight equalized from Cleveland, and 3c., Pittsburgh, now seems to be the ruling quotation of some of the New England manufacturers, who for the time being seem to have abandoned the Worcester, Mass., base. One Pittsburgh district manufacturer has announced effective May 3 a price of 3.25c., base Pittsburgh or Cleveland, for lots of 1 to 3 tons, with a discount of 10c. per 100 lb. for lots of 3 to 10 tons, of 15c. for lots of 10 to 18 tons and of 20c. for lots of 18 tons or more, to apply only on orders for one size and one temper for shipment at one time, plus the regular extras for lots of less than 1 ton of a size. Quantity prices being given, the company is eliminating from contracts the quantity extras when the order is for 18 tons or more at one time. This company has also advanced fender stock prices to 4.75c., net, Pittsburgh or Cleveland, for Nos. 17 to 21 gages, inclusive, and to 4.80c., net, for No. 22 gage, an advance of \$5 per ton.

Bolts, Nuts and Rivets.—April business in bolts and nuts went down rather sharply from that of March, but manufacturers still are holding to the price schedules which became effective April 1. The decline in business is ascribed to the heavy ordering prior to the effectiveness of the new prices rather than to dissatisfaction with them on the part of buyers and distributors. Manufacturers here have encountered little opposition from their customers to the new mode of quotation. Complaints that have been made center largely around the extra 10 per cent charged for broken cases of bolts, but manufacturers say that as the discount of 70 per cent applies to the gross price, the extra charge for broken cases actually amounts to only 3 per cent. Rivets are selling steadily rather than actively at the new prices.

Coke and Coal.—The market in coal and coke is being made by producers without regular consuming connections, and with consumers generally well covered by contracts and also possessing liberal stocks, there is almost no market for spot offerings except at prices that make it questionable whether producers can make a profit even on the non-union scale of wages. Spot furnace coke of standard grade is readily obtainable at \$3 per net ton at ovens, and well below that is quoted on medium and high-sulphur coke. Spot foundry coke ranges from \$4 to \$5.50, but most sales are taking place at \$4 to \$4.50. The union mine suspension has been a fizzle to date in effect upon the market.

Warehouse Prices, f.o.b. Pittsburgh

	Base per lb.
Plates	3.00c.
Structural shapes	3.00c.
Soft steel bars and small shapes	2.90c.
Reinforcing steel bars	2.75c.
Cold-finished shafting and screw stock—	
Rounds and hexagons	3.60c.
Squares and flats	4.10c.
Bands	3.60c. to 3.65c.
Hoops	4.00c. to 4.50c.
Black sheets (No. 24 gage), 25 or more bundles	3.75c.
Galvanized sheets (No. 24 gage), 25 or more bundles	4.50c.
Blue annealed sheets (No. 10 gage) 25 or more sheets	3.30c.
Spikes, large	3.30c. to 3.40c.
Small	3.80c. to 5.25c.
Boat	3.80c.
Track bolts, $\frac{1}{2}$ in. and smaller, per 100 count, 62½ per cent off list	
Machine bolts, per 100 count, 62½ per cent off list	
Carriage bolts, per 100 count, 62½ per cent off list	
Nuts, all styles, per 100 count, 62½ per cent off list	
Large rivets, base per 100 lb.	\$3.50
Wire, black soft annealed, base per 100 lb.	2.90
Wire, galvanized soft, base per 100 lb.	2.90
Common wire nails, per keg	2.90
Cement coated nails, per keg	2.95

(Concluded on page 1342)

Semi-Finished Steel, Raw Materials, Bolts and Rivets

Mill Prices of Semi-Finished Steel

F.o.b. Pittsburgh or Youngstown

Billets and Blooms	Per Gross Ton
Revolving, 4-in. and over.....	\$33.00
Revolving, under 4-in. to and including 1½-in.	34.00
Forging, ordinary	\$39.00 to 40.00
Forging, guaranteed	44.00 to 45.00

Sheet Bars	Per Gross Ton
Open-hearth or Bessemer.....	\$34.00

Slabs	Per Gross Ton
8 in. x 2 in. and larger.....	\$33.00
Smaller than 8 in. x 2 in.	34.00

Skelp	Per Lb.
Grooved	1.90c.
Sheared	1.90c.
Universal	1.90c.

Wire Rods	Per Gross Ton
*Common soft, base.....	\$42.00 to \$43.00
Screw stock	\$5.00 per ton over base
Carbon 0.20% to 0.40%	3.00 per ton over base
Carbon 0.41% to 0.55%	5.00 per ton over base
Carbon 0.56% to 0.75%	7.50 per ton over base
Carbon over 0.75%	10.00 per ton over base
Acid	15.00 per ton over base

*Chicago mill base is \$42.50 to \$44. Cleveland mill base, \$42 to \$43.

Prices of Raw Materials

Ores	Per Gross Ton
Lake Superior Ores, Delivered Lower Lake Ports	
Old range Bessemer, 51.50% iron.....	\$4.55
Old range non-Bessemer, 51.50% iron.....	4.40
Menabi Bessemer, 51.50% iron.....	4.40
Menabi non-Bessemer, 51.50% iron.....	4.25
High phosphorus, 51.50% iron.....	4.15
Foreign Ore, c.i.f. Philadelphia or Baltimore	
Iron ore, low phos., copper free, 55 to 58% iron in dry Spanish or Algeria,	10.50c. to 11.00c.
Iron ore, Swedish, average 66% iron.....	10.00c.
Manganese ore, washed, 52% manganese, from the Caucasus.....	40c. to 41c.
Manganese ore, Brazilian, African or Indian, basis 50%	40c. to 42c.
Tungsten ore, high grade, per unit, in 60% concentrates	\$11.00 to \$12.00
Chrome ore, Indian basic, 48% Cr ₂ O ₃ , crude, c.i.f. Atlantic seaboard.....	\$22.50
Molybdenum ore, 85% concentrates of MoS ₃ , delivered	50c. to 55c.

Coke	Per Net Ton
Furnace, f.o.b. Connellsville prompt	\$3.00
Foundry, f.o.b. Connellsville prompt	\$4.00 to 4.50
Foundry, by-product, Chgo ovens	9.75
Foundry, by-product, New England, del'd	12.00
Foundry, by-product, Newark or Jersey City, delivered.....	9.50 to 10.77
Foundry, Birmingham	5.50 to 6.00
Foundry, by-product, St. Louis....	10.25

Coal	Per Net Ton
Mine run steam coal, f.o.b. W. Pa. mines	\$1.30 to \$1.90
Mine run coking coal, f.o.b. W. Pa. mines	1.80 to 2.00
Mine run gas coal, f.o.b. Pa. mines	2.00
Steam slack, f.o.b. W. Pa. mines..	1.30 to 1.40
Gas slack, f.o.b. W. Pa. mines....	1.40 to 1.50

Ferromanganese	Per Gross Ton
Domestic, 80%, furnace or seab'd.....	\$95.00
Foreign, 80%, Atlantic or Gulf port, duty paid	95.00

Spiegeleisen	Per Gross Ton Furnace
Domestic, 19 to 21%	\$37.00
Domestic, 16 to 19%	36.00

Electric Ferrosilicon	Per Gross Ton Delivered
50%	\$85.00 to \$87.50
75%	145.00
Per Gross Ton Furnace	Per Gross Ton Furnace
10%	\$35.00
11%	37.00
12%	\$45 to 46.00

Bessemer Ferrosilicon	Per Gross Ton
F.o.b. Jackson County, Ohio, Furnace	
10%	\$34.00
11%	36.00
12%	\$38.00

Silvery Iron	Per Gross Ton
F.o.b. Jackson County, Ohio, Furnace	
6%	\$26.50
7%	27.50
8%	28.50
9%	30.00
10%	\$32.00
11%	34.00
12%	36.00

Other Ferroalloys	Per Gross Ton
Ferrotungsten, per lb. contained metal, del'd	\$1.05 to \$1.10
Ferrochromium, 4 to 6% carbon and up, 65 to 70% Cr., per lb. contained Cr. delivered, in carloads	11.50c.
Ferrovandium, per lb. contained vanadium, f.o.b. furnace	\$3.15 to \$3.65
Ferrocobaltititanium, 15 to 18%, per net ton, f.o.b. furnace, in carloads.....	\$200.00
Ferrophosphorus, electric or blast furnace material, in carloads, 18%, Rockdale, Tenn., base, per net ton.....	\$91.00
Ferrophosphorus, electric, 24%, f.o.b. Anniston, Ala., per net ton.....	\$122.50

Fluxes and Refractories	Per Net Ton
Fluorspar	
Domestic, 85% and over calcium fluoride, not over 5% silica, gravel, f.o.b. Illinois and Kentucky mines.....	\$18.00
No. 2 lump, Illinois and Kentucky mines..	\$20.00
Foreign, 85% calcium fluoride, not over 5% silica, c.i.f. Atlantic port, duty paid,	\$16.50 to \$17.00
Domestic, No. 1 ground bulk, 95 to 98% calcium fluoride, not over 2½% silica, f.o.b. Illinois and Kentucky mines.....	\$32.50

Fire Clay	Per 1000 f.o.b. Works
First Quality	\$43.00 to \$46.00
Second Quality	\$35.00 to \$38.00
Pennsylvania	43.00 to 46.00
Maryland	50.00 to 65.00
New Jersey	48.00 to 46.00
Ohio	43.00 to 46.00
Kentucky	48.00 to 46.00
Missouri	7.90
Ground fire clay, per ton	

Silica Brick	Per 1000 f.o.b. Works
Pennsylvania	\$48.00
Chicago	52.00
Birmingham	50.00
Silica clay, per ton.....	\$8.50 to 10.00

Magnesite Brick	Per Net Ton
Standard sizes, f.o.b. Baltimore and Chester, Pa.	\$65.00
Grain magnesite, f.o.b. Baltimore and Chester, Pa.	40.00

Chrome Brick	Per Net Ton
Standard size	\$45.00

Mill Prices of Bolts, Nuts, Rivets and Set Screws

Bolts and Nuts	Per 100 Pieces
(F.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)	
Per Cent Off List	
Machine bolts	70
Carriage bolts	70
Lag bolts	70
Plow bolts, Nos. 1, 2, 3 and 7 heads.....	70
Hot-pressed nuts, blank or tapped, square.....	70
Hot-pressed nuts, blank or tapped, hexagon.....	70
C.p.c. and t. square or hex. nuts, blank or tapped	70
Washers*	6.75c. to 6.50c. per lb. off list

*F.o.b. Chicago and Pittsburgh. †Bolts with rolled threads up to and including ½ in. x 6 in. take 10 per cent lower list prices.

Bolts and Nuts	Per Cent Off List
Semi-finished hexagon nuts	70
Semi-finished hexagon castellated nuts, S.A.E.	70
Stove bolts in packages.....	80, 10 and 5
Stove bolts in bulk.....	80, 10, 5 and 2½
Tire bolts	60 and 5

Large Rivets	Base per 100 Lb.
(½-In. and Larger)	
F.o.b. Pittsburgh or Cleveland.....	\$2.75
F.o.b. Chicago.....	2.85

Small Rivets	Per Cent Off List
(¼-In. and Smaller)	
F.o.b. Pittsburgh	70, 10 and 5
F.o.b. Cleveland	70, 10 and 5 to 70 and 10
F.o.b. Chicago	70, 10 and 5 to 70 and 10

Cap and Set Screws	Per Cent Off List
(Freight allowed up to but not exceeding 50c. per 100 lb. on lots of 200 lb. or more)	
Per Cent Off List	
Milled cap screws	80, 10 and 10
Milled standard set screws, case hardened,	80 and 10
Milled headless set screws, cut thread.....	80
Upset hex. head cap screws, U.S.S. thread.....	85 and 5
Upset hex. cap screws, S.A.E. thread.....	80, 10 and 10
Milled studs	70 and 5

Chicago

Southern Floods Interrupt Warehouse Distribution But Bring Out Emergency Orders

CHICAGO, May 3.—Active steel works stacks have been reduced by one by the blowing out for repairs of the No. 2 blast furnace of the Inland Steel Co. A stock of pig iron has been accumulated, and at present sufficient cold metal is being used to hold ingot production at 85 per cent of capacity. The Steel Corporation continues to blow 22 furnaces, the Wisconsin Steel Works, three, and the Youngstown Sheet & Tube Co., two, bringing the total count of active steel mill furnaces to 30. Ingot production in this district holds at an average of 88 per cent of capacity, and specifications assure a continuation of this rate for the next week or ten days.

Steel output in April was heavy and not far from a record for the fourth month of the year. From the standpoint of sales the market is experiencing a decline, the rate of which, however, is slower than at the end of the first quarter of 1926. Chicago mills are feeling the effects of interrupted distribution by jobbers and warehouses in the flooded areas of the Mississippi River Valley. Orders for roofing sheets for delivery in the South as soon as transportation facilities are available are more numerous, and additional emergency orders for track accessories have been distributed among Western mills by railroads operating in the South. Shading in wire products is more in evidence, particularly on nails in the territory west of Chicago, and wire rods are off \$1 to \$1.50 a ton.

Pig Iron.—The Zenith stack at Duluth, Minn., has been blown out for repairs. Active merchant blast furnaces in this district now include one Mayville, two Federal and one Iroquois, or four out of a total of 10. Shipments in April were not so heavy as in March, and with hold-up orders more numerous, the indications are that there will be a further recession in May. Sales are few in number and small in tonnage. The melt is spotty, showing some improvement in malleable foundries but not sufficient to balance the loss by the gray iron plants. Competition has brought out lower prices to the south, but in Chicago foundry iron is steady at \$20, furnace. A Chicago district buyer has taken 100 tons of low phosphorus iron at \$31.50, delivered. Both silvery and charcoal iron are quiet, individual sales being of the order of 50 to 100 tons each.

Prices per gross ton at Chicago:

Northern No. 2 foundry, sil.	1.75	
to 2.25		\$20.00
N'th'n No. 1 fdy. sil.	2.25 to 2.75	20.50
Malleable, not over 2.25 sil.		20.00
High phosphorus		20.00
Lake Superior charcoal, averaging sil.	1.50	27.04
Southern No. 2 fdy. (all rail)		24.01
Southern No. 2 (barge and rail)		22.18
Low phos., sil. 1 to 2 per cent.		
copper free		\$31.50 to 32.00
Silvery, sil. 8 per cent.		33.29
Bessemer ferrosilicon, 14 to 15 per cent		46.79

Prices are delivered at consumers' yards except on Northern foundry, high phosphorus and malleable which are f.o.b. local furnace, not including an average switching charge of 61c. per gross ton.

Ferroalloys.—Ferromanganese is active for the second half at the new quotation of \$95, seaboard, or \$102.56, delivered. Spiegeleisen is moving in carload lots, and prices are firm. Specifications for ferrosilicon are in good volume.

Prices delivered Chicago: 80 per cent ferromanganese, \$102.56; 50 per cent ferrosilicon, \$85 to \$87.50; spiegeleisen, 18 to 22 per cent, \$44.76.

Structural Material.—The structural steel market is quiet in Chicago except from the viewpoint of new inquiries and prospective projects. Competition for going business is keen, and there has been no improvement in prices on fabricated work. Contracts for two theater buildings at Cedar Rapids, Iowa, call for 1000 tons, and a packing plant in South Dakota will require 350 tons. Fresh inquiry locally includes 1500 tons for bridges and 500 tons for a garage. Plans for the Medinah Athletic Club, a 35-story building, are al-

most completed. Sizable programs for highway bridges are under way in Iowa and Nebraska, and Minnesota is in the market for 925 tons of steel for road bridge work. Floods in the lower Mississippi River Valley have done extensive damage to railroad and highway bridges, for which replacement orders are expected soon after the high water recedes. In Arkansas a railroad bridge consisting of five spans has been swept away at a loss of \$2,000,000. Fabricators in the Chicago district are about 85 per cent engaged, the operations of the larger shops being close to 90 per cent while the smaller fabricators are on a 60 per cent basis. Deliveries on plain material range from prompt to four weeks, depending on the character and size of the order. Prices are steady at 2c. to 2.10c., Chicago.

Mill prices on plain material per lb.: 2c. to 2.10c., Chicago.

Bolts, Nuts and Rivets.—Prices are steady, and users are entering specifications at an unchanged rate. Buyers who take a wide range of sizes of bolts and nuts have offered little or no opposition to the revised price schedule. On the other hand, a few small users whose requirements cover the larger sizes of bolts, which were advanced in price, are resisting the change.

Plates.—Fresh inquiry for railroad equipment includes 4500 freight and 22 passenger cars. The Illinois Central is asking for 2000 box, 1000 general service, 1000 hopper and 500 flat cars, requiring in all not less than 55,000 tons of steel. Specifications for plates against contracts are in good volume, but sales are light. An oil producer in Oklahoma will take 2000 tons of plates for tanks, bringing the total inquiry for oil storage purposes up to 22,000 tons. Mill capacity is fairly well engaged, and deliveries range from prompt to about three weeks, depending on the specifications. Prices are steady at 2c. to 2.10c., Chicago.

Mill prices on plates per lb.: 2c. to 2.10c., Chicago.

Bars.—Although specifications for soft steel bars are still equal to shipments, there is a noticeable slackening in demand from manufacturers who distribute their products through the jobbing trade. This is attributable in part to the impassable conditions of many country roads and to the fact that distribution is at a standstill in the flooded areas of the Central West and the South. Specifications from builders of automobiles are well maintained, and if cancellations are not entered as the month progresses, the May requirements, as indicated by shipping schedules, will approximate the tonnage taken in April. Several manufacturers of farm implements have come into the market for additional steel, the greatest increase in activity being shown by tractor plants. Producers of soft steel bars have substantial order books and backlogs are well in advance of a year ago at this time. In general, deliveries are not available inside of six weeks except on small tonnages that can be added to current rollings. Specifications for iron bars are light, and new buying is virtually at a standstill. Orders for rail steel bars are small and are coming from widely diversified sources. Incoming tonnage bulks fairly large in the aggregate, and specifications are a trifle larger than shipments. Prices in Chicago are steady at 1.90c. to 2c., and there is a better tone to quotations in competitive territory to the south.

Mill prices per lb.: Soft steel bars, 2c. to 2.10c., Chicago; common bar iron, 2c., Chicago; rail steel bars, 1.90c. to 2c., Chicago.

Cast Iron Pipe.—Order books are heavy, but in some cases they are not well balanced, with the result that competition for a number of sizes is keen and prices show a tendency to weaken. In and near Chicago most orders for 6-in. and larger diameter pipe are being taken at close to \$35, Birmingham. Quotations on less attractive tonnages on which prompt shipment is asked range from \$36 to \$37. Shipments into the Southwest are moving freely, and pipe laying operations are getting under way in the Northwest. Orders for delivery to flooded sections of the lower Mississippi Valley are not large, a fact due in some measure to the long rainy season that preceded the floods. Stocks at pipe foundries are said to be low. Park Ridge, Ill., which rejected bids in April, has re-advertised for 360 tons of 6-in., 145 tons of 8-in. and 210 tons of 12-in. Class B pipe. Wooster, Ohio, is in the market for 175 tons of 8-in., 50 tons of 6-in. and 75 tons of 4-in. pipe, and Springfield, Ill., is asking for

prices on 260 tons of 18-in. Class B, 50 tons of 10-in. Class C and 25 tons of 16-in. Class C pipe. Birmingham, Mich., has purchased from an undisclosed dealer 300 tons of 4, 6, 8 and 10-in. pipe, and James B. Clow & Sons have taken 350 tons of 24-in. pipe for Fordson, Mich.

Prices per net ton, delivered Chicago: Water pipe, 4-in. and over, \$43.20 to \$45.20; 4-in., \$47.20 to \$49.20; Class A and gas pipe, \$4 extra.

Rails and Track Supplies.—An Eastern railroad with a terminal at Chicago has placed 10,000 tons of standard-section rails with Chicago mills. The Chesapeake & Ohio is expected to come into the market for about 25,000 tons this coming summer, and it is believed that a Northern railroad that bought sparingly of rails for delivery this spring may come into the market for additional requirements. Track accessory orders are more numerous. They include 3000 tons of angle bars, 3000 tons of tie plates and 4000 kegs of spikes and bolts, the last being emergency orders for railroads operating in the flooded sections of the Mississippi River Valley.

Prices f.o.b. mill, per gross ton: Standard-section open-hearth and Bessemer rails, \$43; light rails, rolled from billets, \$36 to \$38. Per Lb.: Standard railroad spikes, 2.90c.; track bolts with square nuts, 3.90c.; steel tie plates, 2.35c.; angle bars, 2.75c.

Reinforcing Bars.—Awards for the week in Chicago were fairly numerous, although confined mainly to lots of less than 100 tons each. Delay in buying bars is resulting in a continued swelling of the pending list. Two apartment hotels in Chicago call for 750 tons, and a public utility power house addition will take 200 tons. Shop operations are lagging behind the rate of a year ago, but building permits are running well ahead of the early part of 1926. Prices of reinforcing bars out of Chicago warehouses are taking a better stand, common quotations being 2.30c. to 2.75c. for billet stock bars and 2.10c. to 2.55c. for rail steel. New business and recent inquiries are given on page 1339.

Wire Rods.—Orders are of moderate size, and competition is keen for going tonnages. Common quotations on ordinary tonnages are \$42.50 to \$44, base Chicago mill, although the lower price has been shaded on attractive business.

Wire Products.—Specifications from the manufacturing trade are steady, with a slight improvement noted from manufacturers of farm machinery. The jobbing trade has slackened, but this is attributed by producers more to difficulties of distribution than to lack of demand. Road conditions in the near Northwest have improved somewhat, and inquiry from the Pacific Northwest leads supports the belief that shipments of wire products into that territory in May and June will be in good volume. Orders for woven wire fencing are not quite so numerous, but the demand for nails is steady. Mill stocks are small as a result of heavy spring shipments. Producers are holding operations at 60 per cent, which is probably in excess of actual demand, but affords an opportunity to balance and build up stocks in some lines. Mill prices are given on page 1323.

Sheets.—Producers of sheets in the Chicago district

Warehouse Prices, f.o.b. Chicago

	Base per Lb.
Plates and structural shapes.....	3.10c.
Soft steel bars.....	3.00c.
Reinforcing bars, billet steel.....	2.30c. to 2.75c.
Cold-finished steel bars and shafting—	
Rounds and hexagons.....	3.60c.
Flats and squares.....	4.10c.
Bands.....	3.65c.
Hoops.....	4.15c.
Black sheets (No. 24).....	3.95c.
Galvanized sheets (No. 24).....	4.80c.
Blue annealed sheets (No. 10).....	3.50c.
Spikes, standard railroad.....	3.55c.
Track bolts.....	4.55c.
Rivets, structural.....	3.60c.
Rivets, boiler.....	3.60c.
Per Cent Off List	
Machine bolts.....	60
Carriage bolts.....	60
Coach or lag screws.....	60
Hot-pressed nuts, squares, tapped or blank..	60
Hot-pressed nuts, hexagons, tapped or blank.	60
No. 8 black annealed wire, per 100 lb.....	\$3.20
Common wire nails, base per keg.....	\$2.85 to 2.95
Cement coated nails, base per keg.....	2.95

are moving cautiously in the matter of advancing prices and for the time being at least are holding to the old schedule, which has been fairly well maintained in Chicago. Buying is at close range and not so heavy as a week ago. Shipments in April average about 10 per cent below those of March, the best month so far this year. Jobbers in the flooded areas are anticipating a brisk demand for roofing and are now entering orders for delivery as soon as the present situation clears, so that distribution can be made.

Prices per lb., delivered from mill in Chicago: No. 24 black, 3c. to 3.10c.; No. 24 galvanized, 3.90c. to 4c.; No. 10 blue annealed, 2.40c. to 2.50c. Delivered prices at other Western points are equal to the freight from Gary plus the mill prices, which are 5c. per 100 lb. lower than the Chicago delivered prices.

Coke.—A decline in demand for by-product foundry coke is attributable largely to diminished consumption for foundry heating rather than to a reduction in melt. All ovens in this district are lighted. Prices are steady at \$9.75, ovens, and \$10.25, delivered in the Chicago switching district.

Old Material.—The market is turning sharply to the weaker side. Railroad shipments are coming out faster than they can be absorbed by old orders, and dealers, being unwilling to put scrap on the ground unless absolutely forced to do so, are pressing for sales at prices users offer. For the most part, buyers have fair stocks and brokers are confronted with an oversupply of scrap, which cannot be absorbed at the present rate of melt. Gray iron foundries have slowed down, and several steel mill users are limiting shipments to avoid piling scrap beyond their requirements for the immediate future. Competition for railroad lists is less keen, and for the first time in months prices paid are close to those quoted to consumers. Early in the week when the top of the consumer market for heavy melting steel was \$13.25 per gross ton, delivered, the best that a local railroad could get was \$13.45. Prices paid for other grades were proportionately low. The Big Four is offering 3000 tons, and the Pennsylvania, 15,000 tons.

Prices delivered consumers' yards, Chicago:

Per Gross Ton	
Basic Open-Hearth Grades	
Heavy melting steel.....	\$12.75 to \$13.25
Shoveling steel.....	12.75 to 13.25
Frogs, switches and guards, cut apart, and miscellaneous rails.	14.50 to 15.00
Hydraulic compressed sheets....	11.25 to 11.75
Drop forge flashings.....	9.50 to 10.00
Acid Open-Hearth Grades	
Forged, cast and rolled steel car wheels.....	15.50 to 16.00
Railroad tires, charging box size	15.75 to 16.25
Railroad leaf springs, cut apart.	15.75 to 16.25
Steel couplers and knuckles....	15.00 to 15.50
Coil springs.....	16.00 to 16.50
Low phosphorus punchings.....	15.50 to 16.00
Electric Furnace Grade	
Axle turnings.....	12.50 to 13.00
Blast Furnace Grades	
Axle turnings.....	11.00 to 11.50
Cast iron borings.....	10.25 to 10.75
Short shoveling turnings.....	10.25 to 10.75
Machine shop turnings.....	7.50 to 8.00
Rolling Mill Grades	
Iron rails.....	13.50 to 14.00
Rerolling rails.....	15.50 to 16.00
Cupola Grades	
Steel rails, less than 3 ft.....	16.25 to 16.75
Angle bars, steel.....	14.00 to 14.50
Cast iron car wheels.....	14.25 to 14.75
Malleable Grades	
Railroad.....	15.25 to 15.75
Agricultural.....	14.25 to 14.75
Miscellaneous	
Relaying rails, 56 to 60 lb.....	25.50 to 26.50
Relaying rails, 65 lb. and heavier	26.00 to 31.00
Per Net Ton	
Rolling Mill Grades	
Iron angle and splice bars.....	14.00 to 14.50
Iron arch bars and transoms....	18.50 to 19.00
Iron car axles.....	21.00 to 21.50
Steel car axles.....	17.50 to 18.00
No. 1 railroad wrought.....	11.75 to 12.25
No. 2 railroad wrought.....	11.00 to 11.50
No. 1 busheling.....	9.75 to 10.25
No. 2 busheling.....	6.50 to 7.00
Locomotive tires, smooth.....	15.50 to 16.00
Pipes and flues.....	7.50 to 8.00
Cupola Grades	
No. 1 machinery cast.....	16.50 to 17.00
No. 1 railroad cast.....	15.50 to 16.00
No. 1 agricultural cast.....	14.75 to 15.25
Stove plate.....	13.50 to 14.00
Grate bars.....	12.50 to 13.00
Brake shoes.....	11.50 to 12.00

*Relaying rails, including angle bars to match, are quoted f.o.b. dealers' yards.

New York

Barge Rate on Pig Iron Drops— General Advance in Sheets

NEW YORK, May 3.—Activity in the pig iron market is limited mainly to small-lot purchases. Sales in this territory during the past week totaled about 7000 tons, or about 3000 tons less than in the previous week. The Richmond Radiator Co. has closed against its inquiry for 1200 tons of No. 2 plain foundry for barge delivery at Norwich, Conn. The Crane Co., Bridgeport, Conn., is still in the market for a round tonnage of foundry iron, but otherwise large inquiries are lacking. Many foundries are finding it necessary to slow up operations and, in some instances, are holding up shipments against past purchases of iron. With melt tapering, there is less interest in forward requirements and orders for early shipment are being placed with increased caution. Prices on foundry iron remain unchanged at \$17.50 to \$18, base Buffalo, and at \$20.50 to \$21, base eastern Pennsylvania furnace. Barge rates on pig iron shipped from Buffalo to New York have been reduced 25c. a ton to \$2.50. This means a corresponding reduction in the delivered price on barge iron. Relatively little foreign iron is being sold in this section.

Prices per gross ton, delivered New York district:

Buffalo No. 2 fdy., sil. 1.75 to 2.25 (all rail)	\$22.41
No. 2 plain fdy. (by barge, del'd alongside in lighterage limits N. Y. and Brooklyn)	\$20.00 to 20.50
East. Pa. No. 2 fdy., sil. 1.75 to 2.25	21.89 to 23.02
East. Pa. No. 2X fdy., sil. 2.25 to 2.75	22.39 to 23.52
East. Pa. No. 1X fdy., sil. 2.75 to 3.25	22.89 to 24.02
No. 2 Virginia fdy., sil. 1.75 to 2.25	27.04

Freight rates: \$4.91 from Buffalo, \$1.39 to \$2.52 from eastern Pennsylvania, \$5.54 from Virginia.

Reinforcing Bars.—Following a week of more activity than the market has seen for some time, awards in the last few days have been meager, and the volume of small orders has not been large. Distributors in this territory continue to quote the following prices:

Prices per lb. on billet steel reinforcing bars: From mill, 2c. Pittsburgh. Out of New York warehouse, 3.15c., delivered at job. Out of Youngstown warehouse, 2.50c., Youngstown, or 2.87½c., delivered New York.

Warehouse Business.—Activity continues to be limited to small-lot purchases. Prices, however, continue fairly firm, except for occasional concessions on bolts and screws and shading of prices on black and galvanized sheets. With most jobbers April business was fair but not much in excess of March. There is still a good tonnage of structural material moving from stock in small lots of a few tons each.

Cast Iron Pipe.—There is active purchasing of small lots of pipe by private companies, but municipal inquiry is quiet. The bids on about 4000 tons of pipe for New York will be opened May 5. Syracuse, N. Y., opened bids May 2 on 6500 tons of 30-in. water pipe. Contractors' bids involving about 200 tons of water pipe were opened at Chatham, N. J., last week, but the award has not yet been announced. Prices still exhibit some tendency toward softness, with Southern makers quoting on a basis of \$37, Birmingham, and less.

Prices per net ton, delivered New York: Water pipe, 6-in. and larger, \$46.60 to \$48.60; 4-in. and 5-in., \$51.60 to \$53.60; 3-in., \$61.60 to \$63.60; Class A and gas pipe, \$5 extra.

Finished Steel.—An advance in prices has been put into effect by sheet manufacturers, making the new quotations 3.85c., Pittsburgh, on galvanized, 3c. on black and 2.25c. on blue annealed. The announcement was made by one or two large companies the middle of last week and others, without exception so far as is known here, have followed. However, the higher prices have scarcely had time to be confirmed by sales because mills permitted customers to send in pending tonnage at former prices, such protection being held open in some instances until the first of this week. The new prices represent an advance from recent minimum quotations of \$5 a ton on galvanized sheets, \$6 on black

and \$3 on blue annealed. Contrary to usual procedure, the advances were not due to an increasing demand but to losses which most, if not all, of the mills were incurring through continued price cutting. Structural steel is still one of the weak spots in the market and a good deal of the recent tonnage in this market has been figured on the basis of 1.75c., Pittsburgh, for the plain material. Prices for fabricated steel also continue very low. One explanation for this is that steel fabricators have not yet adjusted themselves to the new buying conditions whereby contracts are not placed far ahead but generally for immediate work, thus preventing the accumulation of backlogs to which the fabricating trade has been accustomed. Concessions on plates are more frequent, fixing the market at 1.85c., Pittsburgh, for the larger tonnages and at 1.90c. for small lots. The range on steel bars is 1.85c. to 1.90c., Pittsburgh. Cold rolled strip steel is still being sold at concessions from the quotation of 3c. established early in the year, the concessions varying according to the size of the order and the extras applying. The volume of business in nearly all products during the

Warehouse Prices, f.o.b. New York

Base per Lb.

Plates and structural shapes	3.34c.
Soft steel bars and small shapes	3.24c.
Iron bars	3.24c.
Iron bars, Swedish charcoal	7.00c. to 7.25c.

Cold-finished steel shafting and screw stock—

Rounds and hexagons	4.00c.
Flats and squares	4.50c.
Cold-rolled strip, soft and quarter hard	5.75c.
Hoops	4.49c.
Bands	3.99c.
Blue annealed sheets (No. 10 gage)	3.89c.
Long terne sheets (No. 24 gage)	5.80c.
Standard tool steel	12.00c.
Wire, black annealed	4.50c.
Wire, galvanized annealed	5.15c.
Tire steel, 1½ x ½ in. and larger	3.30c.

Smooth finish, 1 to 2½ x ¼ in. and larger

Open-hearth spring steel, bases

Machine bolts, cut thread

¼ x 6 in. and smaller

1 x 30 in. and smaller

Carriage bolts, cut thread

½ x 6 in. and smaller

¾ x 20 in. and smaller

Coach screws

½ x 6 in. and smaller

1 x 16 in. and smaller

Boiler Tubes—

Lap welded steel, 2-in.

Seamless steel, 2-in.

Charcoal iron, 2-in.

Charcoal iron, 4-in.

Discounts on Welded Pipe

Standard Steel—

¾-in. butt.

¾-in. butt.

¾-in. butt.

2½-6-in. lap.

7 and 8-in. lap.

11 and 12-in. lap.

Wrought Iron—

¾-in. butt.

¾-in. butt.

1-1½-in. butt.

2-in. lap.

3-6-in. lap.

7-12-in. lap.

Tim Plate (14 x 20 in.)

Coke, 100 lb. base box

Charcoal, per box—

IC

IX

IXX

Terne Plate (14 x 20 in.)

IC—20-lb. coating

IC—30-lb. coating

IC—40-lb. coating

Sheets, Box Annealed—Black, C. R. One Pass

Nos. 18 to 20

No. 22

No. 24

No. 26

No. 28*

No. 30

Sheets, Galvanized

No. 14

No. 16

No. 18

No. 20

No. 22

No. 24

No. 26

No. 28*

No. 30

*No. 28 and lighter, 36 in. wide, 20c. higher per 100 lb.

past week has tapered off, a condition which probably will be reflected in reduced mill operations this month.

Mill prices per lb. delivered New York: Soft steel bars, 2.19c. to 2.24c.; plates, 2.14c. to 2.24c.; structural shapes, 2.09c. to 2.24c.; bar iron, 2.14c. to 2.24c.

Ferroalloys.—British producers of ferromanganese have reduced their quotations \$5 per ton, from \$100 to \$95, seaboard, effective at once. Other producers have met this reduction. The market is inactive and sales are confined to carload and small lots. Consumers are believed to be covered only for the first half and it is expected that buying for the second half will soon appear. The spiegeleisen market is very inactive and no transactions of importance are reported. Prices for this alloy are unchanged.

Old Material.—Buying prices on most grades still show a tendency to decline to lower levels, although the profit for the collector of scrap is now almost non-existent on many grades. A moderate volume of material is available, however, from producers of scrap forced to keep steady accumulations moving from their yards. No. 1 heavy melting steel is being purchased at \$14 to \$14.50 per ton, delivered eastern Pennsylvania, and offers of consumers to purchase at prices that would necessitate a still lower buying market have not yet met with acceptance by dealers. Machine shop turnings are being purchased at \$10.50 per ton, delivered to a Phoenixville, Pa., consumer, and stove plate at \$11.75 per ton, delivered to a Harrisburg mill for which \$15.50 per ton is being paid by brokers with orders for heavy breakable cast. Chemical borings are being bought at \$14.75 per ton, delivered to a Bound Brook, N. J., plant. On May 4 the Pennsylvania Railroad will open bids on about 50,000 tons of old material. The Department of Water Supply, Gas and Electricity, New York, opens bids May 10, on about 500 tons of scrap, mostly cast iron, scattered in small lots at various points in Manhattan, the Bronx, Brooklyn and Queens.

Dealers' buying prices per gross ton, New York:

No. 1 heavy melting steel.....	\$10.75 to \$11.85
Heavy melting steel (yard).....	8.00 to 8.25
No. 1 heavy breakable cast.....	11.75 to 13.00
Stove plate (steel works).....	8.00 to 8.50
Locomotive grate bars.....	9.00 to 9.75
Machine shop turnings.....	7.00 to 8.00
Cast borings (blast furnace or steel works).....	7.50 to 8.00
Mixed borings and turnings.....	7.50 to 8.00
Steel car axles.....	16.00 to 16.50
Iron car axles.....	24.00 to 24.50
Iron and steel pipe (1 in. diam., not under 2 ft. long).....	9.25 to 9.75
Forge fire.....	8.00 to 8.50
No. 1 railroad wrought.....	12.00 to 12.50
No. 1 yard wrought, long.....	11.00 to 11.50
Rails for rolling.....	11.50 to 12.00
Cast iron carwheels.....	11.00 to 11.50
Stove plate (foundry).....	9.75 to 10.00
Malleable cast (railroad).....	11.25 to 11.75
Cast borings (chemical).....	12.50 to 13.00

Prices per gross ton, delivered local foundries:

No. 1 machinery cast.....	\$15.00 to \$15.50
No. 1 heavy cast (columns, building materials, etc.), cupola size	13.50 to 14.00
No. 2 cast (radiators, cast boilers, etc.).....	12.50 to 13.00

Coke.—Prices continue weak, and foundry coke for prompt shipment is obtainable at as low as \$4 per ton, Connellsville, with quotations for future delivery, through July and August, at \$4.50 to \$5 per ton, Con-

nellsville. Furnace grade is quoted at \$3 to \$3.25 per ton, Connellsville, for prompt carloads and at about \$3.50 for future delivery. Delivered prices for Connellsville foundry coke are: To northern New Jersey, \$8.03 to \$9.03; New York or Brooklyn, \$8.79 to \$9.79; Newark or Jersey City, N. J., \$7.91 to \$8.91 per ton. Although the New England price of by-product foundry coke has been reduced by 50c. per ton, the local operation continues to quote \$9.59 to \$10.77 per net ton, delivered Newark or Jersey City, N. J.

Cleveland

Water Competition Accentuates Weakness in Bars—Sheet Advance General

CLEVELAND, May 3.—The volume of business in finished steel is rather light, showing little change from the previous two or three weeks. Consuming industries are keeping up to recent operations, but are using up old stocks and are buying very closely for early requirements. Reports from the automotive industry are still encouraging in that they indicate that the present production of motor cars will be kept up at least through May.

Keen competitive conditions have made 1.85c., Pittsburgh, a more common price on steel bars. This figure is now quoted quite generally to the automotive industry, and other buyers can secure the same price for orders confined largely to one size. One mill has gone as low as 1.80c., Pittsburgh, for steel bars. Detroit is often the center of a weak market, and this condition is perhaps being accentuated at present in that city by the opening of water transportation of steel. A Buffalo mill has sold a round tonnage of steel bars for Detroit shipment, and a Cleveland bar mill has also taken some Detroit business to be shipped by water. On plates and structural material 1.85c. is also appearing in Detroit.

The Pittsburgh Steamship Co. has sent out an inquiry for two freight boats, requiring 10,000 tons of steel, which will supplement two now being built for this company. Lake shipyards have also received an inquiry for another boat, requiring 2000 tons of steel. Building work in this territory is still quiet, and fabricators are in need of business and are quoting low prices. The only large local award is the Cleveland Club, requiring 2200 tons. Outside mills quote steel bars at 1.85c. to 1.90c., Pittsburgh, for Cleveland delivery. The local mill price is unchanged at 1.90c., Cleveland, but is not being firmly maintained. Plates and structural material appear to be holding well in this market at 1.90c., Pittsburgh.

Pig Iron.—Sales fell off considerably during the week and were limited to small lots for filling out second quarter requirements. Little activity is expected until consumers come into the market for the third quarter. At present they are showing no interest in that delivery, and producers are not attempting to make third quarter sales. April shipments made a good total, exceeding production with some of the furnaces, although they did not quite equal those of March. The automotive industry is starting May with shipping orders about equal to those of recent weeks. Business with northern Ohio jobbing foundries has slowed down somewhat. There is scarcely enough market activity to arouse much interest in prices, which appear to be holding to recent levels. For Cleveland delivery the reduction of 50c., noted last week, to \$19, furnace, for foundry and malleable iron has become more general. For outside shipment there is a range of \$18 to \$18.50, furnace, the lower price being for delivery to points where Cleveland producers have a freight disadvantage. Other Lake Erie producers continue to quote from \$18.50 to \$19, furnace. In Michigan \$19.50, furnace, is still the ruling price. A Pittsburgh district consumer has purchased 1000 tons of low phosphorus iron from a Valley producer at \$27.50,

Warehouse Prices, f.o.b. Cleveland

	Base per Lb.
Plates and structural shapes.....	3.00c.
Soft steel bars.....	3.00c.
Reinforcing steel bars.....	2.75c. to 3.00c.
Cold-finished rounds and hexagons.....	3.65c.
Cold-finished flats and squares.....	4.15c.
Hoops and bands.....	3.65c.
Cold-rolled strip.....	*5.95c.
Black sheets (No. 24).....	3.65c.
Galvanized sheets (No. 24).....	4.50c.
Blue annealed sheets (No. 10).....	3.25c.
No. 9 annealed wire, per 100 lb.....	\$2.90
No. 9 galvanized wire, per 100 lb.....	3.35
Common wire nails, base, per keg.....	2.90

*Net base, including boxing and cutting to length.

furnace, but with this exception the market for this grade is inactive.

Prices per gross ton at Cleveland:

N'th'n No. 2 fdy., sil. 1.75 to 2.25...	\$19.50 to \$20.00
Southern fdy., sil. 1.75 to 2.25...	24.00 to 24.50
Malleable	19.50 to 20.00
Ohio silvery, 8 per cent.....	31.50
Basic, Valley furnace.....	19.00
Standard low phos., Valley fur..	27.50 to 28.00

Prices, except on basic and low phosphorus, are delivered Cleveland. Freight rates: 50c. from local furnaces; \$3 from Jackson, Ohio; \$6 from Birmingham.

Iron Ore.—Shipments are getting under way rather slowly, and open pit mines in the Mesabi district are not yet in full operation. Most furnaces have good stocks, and many are holding back on shipments. Several furnaces have some of their ore storage space filled with coal, so that storage room is not available. A few small-lot sales are reported, but generally the market is slow.

Water shipments of Lake ore during April were 1,550,422 tons.

Semi-Finished Steel.—There is little new demand, and specifications are only fair. Sheet bars are holding firmly to \$34, Cleveland, but in view of the common price of \$33, Pittsburgh and Youngstown, on billets and slabs the local market has settled down to the same price with the same base.

Sheets.—Most of the independent sheet mills have fallen in line with the advances announced a few days ago by a Youngstown mill, which brings prices up \$2 to \$6 a ton above those that have been prevailing recently, or about to the level of quotations that was in effect last December. New prices are 3c. for black, 2.25c. for blue annealed, 3.85c. for galvanized and 4.25c., for automobile body sheets, all Pittsburgh base. Some of the Ohio mills that have been quoting a mill base have gone back to the Pittsburgh base. While all the smaller mills have not yet fallen in line with the advance, leading producers seem determined to hold to the higher prices, asserting that there is no profit in sheets at the recent prices. Buyers were taken by surprise and did not have an opportunity to cover before the advance. While a few small-lot orders have been taken for quick shipment at the higher prices, these prices have not yet been tested. Black sheets can still be bought at 2.70c. and automobile body sheets at 4.15.

Strip Steel.—There is talk of an advance on hot-rolled strip, which is now quoted at \$4 a ton below last December prices. However, an advance will not mean much for some time, as most customers are covered for the second quarter. There is still some irregularity in prices, with sales at a concession of \$2 a ton to 2c., Pittsburgh, on wide material. While specifications are fair, mills could take care of more tonnage. Cold-rolled strip is firm at 3c., Cleveland, for both large and small lots. Specifications are fair, but new demand is light.

Alloy Steel.—The market is being disturbed locally by a Cleveland base that is being quoted on some grades by two smaller producers. With this exception, prices are being well maintained. The demand from the automotive industry is fair.

Warehouse Business.—The demand is very satisfactory. The number of orders has increased, but they are for smaller lots than recently. Prices are firm. Jobbers expect to advance sheets if the new mill prices hold.

Reinforcing Bars.—An inquiry has come out for 500 tons for a warehouse for the Ohio Bell Telephone Co., but other work is slow in developing, owing partly to the unsettled local labor situation. Rail steel bars are unchanged at 1.70c. to 1.80c., mill.

Bolts, Nuts and Rivets.—Most bolt and nut shipments in the past month, both to consumers and jobbers, were on contracts placed before new price lists were brought out, and makers have not yet taken many orders on the new price basis. Shipments are still good, but makers are getting cleaned up on old orders, and the real test of the new prices is yet to come. Rivet specifications are fair, and the new prices are being well maintained.

Coke.—Activity is limited. Sales of standard Connellsville foundry coke are reported at \$4.50, ovens, but some makes are available at \$4. Heating coke is unchanged at \$3, ovens.

Old Material.—With demand very limited, scrap is backing up on the market and prices are lower. There is no buying by the mills, and dealers have little tonnage on their books in unfilled orders. New scrap offerings of the week include considerable tonnage from the various units of the General Motors Corporation. Dealers have been able to buy heavy melting steel at \$14 to \$13.50 for Nos. 1 and 2 respectively, or 25c. a ton lower than during the previous week. Prices on blast furnace grades are untested, but they appear to be 25c. a ton lower than a week ago.

Prices per gross ton, delivered consumers' yards:

Basic Open-Hearth Grades	
No. 1 heavy melting steel.....	\$14.00 to \$14.25
No. 2 heavy melting steel.....	13.50 to 13.75
Compressed sheet steel.....	13.25 to 13.50
Light bundled sheet stampings...	12.00 to 12.50
Drop forge flashings.....	12.50 to 13.00
Machine shop turnings.....	9.00 to 9.25
No. 1 railroad wrought.....	11.50 to 12.00
No. 2 railroad wrought.....	14.00 to 14.25
No. 1 busheling.....	12.50 to 12.75
Pipes and flues.....	10.00 to 10.50
Steel axle turnings.....	12.50 to 13.00
Acid Open-Hearth Grades	
Low phosphorus forging crops...	16.50 to 17.00
Low phosphorus, billet bloom and slab crops	17.00 to 17.50
Low phosphorus sheet bar crops...	16.00 to 16.50
Low phosphorus plate scrap.....	16.00 to 16.50
Blast Furnace Grades	
Cast iron borings.....	10.75 to 11.00
Mixed borings and short turnings	10.75 to 11.00
No. 2 busheling.....	10.75 to 11.00
Cupola Grades	
No. 1 cast.....	16.50 to 17.00
Railroad grate bars.....	12.00 to 12.50
Stove plate	12.00 to 12.50
Rails under 3 ft.	18.00 to 18.50
Miscellaneous	
Railroad malleable	15.50 to 16.00
Rails for rolling.....	16.25 to 16.50

Philadelphia

Sheet Buyers Before Advance—Steel Demand Recedes, Iron Melt Tapers

PHILADELPHIA, May 3.—In the absence of other important developments, interest in the market in the past few days has centered in the announcement by manufacturers of sheets of advances in prices, effective at once. The new prices are 2.25c., Pittsburgh, for blue annealed, 3c. for black and 3.85c. for galvanized. Recent low levels have been \$5 or \$6 a ton below these prices on black and galvanized sheets and \$2 or \$3 a ton on blue annealed. Consumers and jobbers were

Warehouse Prices, f.o.b. Philadelphia

	Base per Lb.
Plates, ¼-in. and heavier.....	2.80c. to 3.00c.
Plates, ⅜-in.	3.00c. to 3.20c.
Structural shapes	2.65c. to 3.00c.
Soft steel bars, small shapes and iron bars (except bands)....	2.70c. to 3.20c.
Round-edge iron	3.50c.
Round-edge steel, iron finished, 1½ x 1½ in.....	3.50c.
Round-edge steel, planished....	4.30c.
Reinforcing steel bars, square, twisted and deformed.....	3.00c.
Cold-finished steel, rounds and hexagons	4.00c.
Cold-finished steel, squares and flats	4.50c.
Steel hoops	3.85c. to 4.15c.
Steel bands, No. 12 gage to ⅝-in., inclusive	3.60c. to 3.90c.
Spring steel	5.00c.
Black sheets (No. 24).....	4.15c.
Galvanized sheets (No. 24)....	5.10c.
Blue annealed sheets (No. 10)...	3.30c.
Diamond pattern floor plates—	
¼-in.	5.30c.
⅝-in.	5.50c.
Rails	3.20c.
Swedish iron bars.....	6.60c.

quite generally given an opportunity to specify their requirements for this month at former prices, so the real effect of the new schedule will not be seen until the latter part of the month, when June needs are covered.

There is a slow but steady decline in the volume of steel purchasing, some lines being affected more than others, but it is particularly noticeable that seasonal buying of steel for building construction, except in small lots, is nearing an end in this district. Very few new projects are up for bids. The pig iron and scrap markets are extremely dull, but prices are holding.

Pig Iron.—Melters of iron are taking little or no interest in the market. Inquiries and sales are few in number and generally for lots ranging from a carload to 100 tons. The furnaces of this district are well supplied with orders for the remainder of this quarter, but have no tonnage of importance for third quarter except that which may be carried over because of a slightly declining rate of consumption at many foundries. Prices of foundry iron remain firm on the basis of \$21, furnace, for the base grade. Sales of a few hundred tons of low phosphorus iron have been made for shipment to the Pittsburgh district.

Prices per gross ton at Philadelphia:

East. Pa. No. 2 plain, 1.75 to 2.25 sil.	\$21.76 to \$22.26
East. Pa. No. 2X, 2.25 to 2.75 sil.	22.26 to 22.76
East. Pa. No. 1X.	22.76 to 23.26
Basic (delivered eastern Pa.)	20.75 to 21.25
Gray forge	21.00 to 21.50
Malleable	22.50 to 23.00
Standard low phos. (f.o.b. New York State furnace)	25.00
Copper bearing low phos. (f.o.b. furnace)	25.00 to 26.00
Virginia No. 2 plain, 1.75 to 2.25 sil.	26.67
Virginia No. 2X, 2.25 to 2.75 sil.	27.17

Prices, except on low phosphorus, are delivered Philadelphia. Freight rates: 76c. to \$1.64 from eastern Pennsylvania furnaces; \$5.17 from Virginia furnaces.

Ferromanganese.—The decision of English producers of ferromanganese to reduce their quotations to \$95, seaboard, which was cabled to selling agents here a few days ago, has not resulted in sales. Its principal effect thus far is to bring about a revision of prices on unshipped tonnage by the two leading domestic makers whose contracts for first half protected buyers against a decline.

Plates.—Hand-to-mouth buying of plates is sufficient to keep the operations of Eastern mills at about the same level as in recent weeks, which is 50 to 60 per cent of capacity. Some sales are being made at 1.90c., Pittsburgh, but quotations of 1.85c. have been extended to most of the regular buyers.

Structural Shapes.—Although April business with Eastern structural mills was larger than that of March, orders and specifications now show signs of falling off. New building projects involving structural shapes are few, large jobs being almost entirely lacking. A decision may be reached this week on the new building for the Baldwin Locomotive Works to be erected at Eddystone, Pa. This will take 8000 tons. Quotations on ordinary lots of shapes range from 1.80c. to 1.90c., Pittsburgh, with concessions still to be had on sizable tonnages.

Bars.—The past week has brought out more quotations of 1.85c., Pittsburgh, on steel bars, with 1.90c. applying, however, on the smaller lots. There is no appreciable change in the volume of business. Bar iron is quoted at 2.12c. to 2.22c., Philadelphia.

Imports.—Following are the products and quantities brought in from abroad last week at Philadelphia: Iron ore from Sweden, 10,853 tons; chrome ore from Portuguese East Africa, 5162 tons; chrome ore from Brazil, 1820 tons; manganese ore from British West Africa, 3971 tons; manganese ore from Chile, 1200 tons; pig iron from the Netherlands, 350 tons; bar iron from Sweden, 13 tons; steel bars from Sweden, 229 tons; steel bars from Belgium, 15 tons; blooms from France, 1290 tons; structural shapes from Belgium, 68 tons; structural shapes from Germany, 26 tons.

Old Material.—Nothing has happened to stir the scrap market from the condition of lethargy that has characterized it for several weeks. The best that can be said is that prices are no weaker, but there is very

little buying and traders have given up hope of any revival of important activity before early fall.

Prices per gross ton, delivered consumers' yards, Philadelphia district:

No. 1 heavy melting steel	\$14.50 to \$15.00
Scrap T rails	14.00 to 14.50
No. 2 heavy melting steel	12.00 to 13.50
No. 1 railroad wrought	16.50 to 17.00
Bundled sheets (for steel works)	11.00 to 11.50
Machine shop turnings (for steel works)	11.00 to 11.50
Heavy axle turnings (or equivalent)	13.50 to 14.00
Cast borings (for steel works and rolling mill)	12.00
Heavy breakable cast (for steel works)	15.50 to 16.00
Railroad grate bars	12.50 to 13.00
Stove plate (for steel works)	12.50 to 13.00
No. 1 low phos., heavy, 0.04 per cent and under	19.00 to 19.50
Couplers and knuckles	17.00 to 17.50
Roller steel wheels	17.00 to 17.50
No. 1 blast furnace scrap	10.50 to 11.00
Machine shop turnings (for rolling mill)	11.50 to 12.00
Wrought iron and soft steel pipes and tubes (new specifications)	13.50 to 14.00
Shafting	18.00 to 19.00
Steel axles	19.00 to 20.00
No. 1 forge fire	12.00 to 12.50
Steel rails for rolling	16.50 to 17.00
Cast iron carwheels	16.00 to 16.50
No. 1 cast	17.00 to 17.50
Cast borings (for chemical plant)	15.00 to 16.00

Amalgamated Association to Ask Sharp Wage Increases

CLEVELAND, May 3.—Demands for sharp wage increases will be made by the Amalgamated Association of Iron, Steel and Tin Workers at the annual conference to be held at Atlantic City, May 24. Negotiations between manufacturers and officials of the association were held in Cleveland during the week without results. The puddlers have formulated a new wage scale which starts with the same base as at present, but progresses rapidly with the advance in the price of bar iron. When the average sales price is 1.95c., the boiling rate will be \$13.65 a ton under the proposed scale. A \$1.50 a ton extra for boiling in July, August and September is asked, and other demands specify that puddling mills work only five days a week and that muck roll crews and bar mill crews be given a 10 per cent advance. The sheet and tin mill workmen are dissatisfied with the basing of wages on Nos. 26 to 28 gages and will ask that sub-committees be appointed to work out a system of basing wages on the average sales price of gages 21 to 30, inclusive.

Shipping Board Denies Cutting Rates on Foreign Shipments

Concerning the recent statement of J. A. Campbell, president Youngstown Sheet & Tube Co., that Shipping Board vessels in the Trans-Atlantic service were cutting rates on steel to the detriment of American steel producers, the following statement has been given out at the Shipping Board, Washington, which denies that the difference in rates, as ascribed by Mr. Campbell, exists.

The Black Diamond Steamship Corporation, operator of the American Diamond Line, states that since November, 1926, it has booked no steel from Antwerp to the North Atlantic seaboard at rates below a range of \$4.50 to \$6.75 per ton. Mr. Campbell stated that the rate from Antwerp to the Atlantic seaboard via the American Diamond Line was \$2.85, as compared with \$4 per ton for the conference rate.

Eight-Hour Turns Exceed Record of More 12-Hour Turns

In the last issue of the *Industrial Bulletin* of the Colorado Fuel & Iron Co. mention is made of the fact that the 10-in. merchant mill at Pueblo, Colo., made a new record in 1926, turning out 60,148 tons, as against a previous record of 60,125 tons in 1917. The excess of 23 tons is not the significant thing about this record, but the fact that the total of 60,125 tons in 1917 was rolled in 530½ 12-hr. turns, whereas the 60,148 tons of last year was rolled in 528¼ 8-hr. turns.

San Francisco

Steel Buying Is Heavier—Plate Awards Total 9919 Tons

SAN FRANCISCO, April 30 (By Air Mail).—Heavier buying of plates and shapes has been a feature of the week. In plates, lettings total 9919 tons, of which 5000 tons is for the construction of a municipal gas holder at Long Beach, Cal., the contract going to the Stacy Brothers Gas Construction Co., Cincinnati. The situation in regard to prices is unchanged. Most of the Eastern mills are holding firmly to the prices they have been quoting for the past three weeks on plates, shapes and bars. While reports of price concessions in plates still persist in some quarters, confirmation is lacking. So far as can be ascertained, the minimum quotation on plates is 2.30c., c.i.f. Coast ports.

Pig Iron.—The lack of interest that has prevailed in this department of the market for several weeks continues. Buying is for small lots only and inquiries are relatively unimportant. Quotations are unchanged.

Prices per gross ton at San Francisco:

*Utah basic	.....	\$25.00 to \$26.00
*Utah foundry, sil. 2.75 to 3.25	.....	25.00 to 26.00
**Indian foundry, sil. 2.75 to 3.25	.....	25.00
**German foundry, sil. 2.75 to 3.25	.....	24.25

*Delivered San Francisco.

**Duty paid, f.o.b. cars San Francisco.

Shapes.—Lettings of fabricated structural steel for the week total 2664 tons. Fresh inquiries call for 2636 tons. The largest individual award, 1224 tons for a garage and warehouse for Meier & Frank, Portland, Ore., was taken by Poole & McGonigle of that city. Locally structural lettings have been confined to comparatively small tonnages. Bids are expected to be called for in about 60 days on 800 tons for a boxing arena in San Francisco, and in Portland, Ore., bids have closed on 1552 tons for a bridge for Multnomah County. Eastern mills continue to quote plain material at 2.35c., c.i.f. Coast ports.

Plates.—In addition to the 5000 tons for a gas holder mentioned above, there have been two other notable lettings during the past week. In Seattle, Wash., the Pacific Car & Foundry Co. took 1800 tons for underframes for the Pacific Fruit Express, and in San Francisco the Feather River Power Co. placed 2100 tons for its Bucks Creek project with the Western Pipe & Steel Co. Beverly Hills, Cal., will open bids May 9 on 160 tons for a riveted pipe line, and the Talent Irrigation District, Talent, Ore., has closed bids on about 100 tons for a steel syphon.

Bars.—While lettings have been neither numerous nor large, there is a good deal of concrete construction work being figured, especially in southern California. The largest individual award of the week, 140 tons for the Winchell School in Fresno, Cal., was taken by the Frederick Steel Co., Alameda, Cal. It is understood that Belgian reinforcing bars will be supplied. The city of Los Angeles has awarded 100 tons required under Specification P-778 to the California Hardware Co. of Los Angeles. Local concrete bar jobbers quote as follows: 2.85c., base, per lb., on lots of 200 tons, and 3.10c., base, on less-than-carload lots.

Cast Iron Pipe.—Nearly 3500 tons of pipe has been awarded during the past week. Notable among fresh inquiries is 2190 tons of 4 to 20-in. Class B pipe for Arcadia, Cal., on which bids will be opened May 18. In Monrovia, Cal., a referendum on a bond issue of \$233,000 has been recommended by the city engineer for the purchase of new water-bearing lands and for

Warehouse Prices, f.o.b. San Francisco

	Base per Lb.
Plates and structural shapes	..... 3.00c.
Soft steel bars	..... 3.00c.
Small angles, $\frac{1}{2}$ -in. and over	..... 3.00c.
Small angles, under $\frac{1}{2}$ -in.	..... 3.40c.
Small channels and tees, $\frac{1}{2}$ -in. to 2 $\frac{1}{4}$ -in.	..... 3.60c.
Spring steel, $\frac{1}{2}$ -in. and thicker	..... 5.00c.
Black sheets (No. 24)	..... 4.70c.
Common wire nails, base per keg	..... \$3.75
Cement coated nails, 100-lb. keg	..... 3.75
Blue annealed sheets (No. 10)	..... 3.75c.
Galvanized sheets (No. 24)	..... 5.25c.

an extension of the municipal water system. The City Council is expected to act favorably on this recommendation at an early date. Larger lettings of the week include the following: Los Banos, Cal., awarded 182 tons of 4 and 6-in. Class B pipe to an unnamed producer through Geo. C. De Golyer, general contractor. Burbank, Cal., placed 583 tons with an unnamed company through the Gibbons & Reed Co., general contractor. The Water & Power Commission, Los Angeles, awarded 2575 tons of 2-in. pipe, of which 1732 tons was taken by the Pacific States Cast Iron Pipe Co., 270 tons by the Crane Co., and 573 tons by the American Cast Iron Pipe Co.

Steel Pipe.—The Western Pacific Railroad Co., San Francisco, has placed 400 tons of standard pipe with an unnamed Eastern producer. The Coast Counties Gas & Electric Co., Santa Cruz, Cal., has awarded 720 tons of 6 $\frac{1}{2}$ -in. steel pipe (360 tons each) to the Crane Co. and the Grinnell Co. of the Pacific. Arcadia, Cal., will open bids May 18 on about 1000 tons of 12 to 20-in. standard pipe.

Warehouse Business.—April closes with local jobbers reporting slightly larger buying, but the sales average for the month is not expected to show much of a gain over March. Quotations are unchanged.

Sheets.—The Columbia Steel Corporation, San Francisco, has been awarded 400 tons of black sheets for motor vehicle license plates for 1928 by the State of Washington. In general this department of the market is relatively quiet.

Coke.—Buying is small and confined to spot needs, which on the whole are limited. Fresh imports from Europe are expected at this port in the near future. Local importers quote on specific inquiries only.

St. Louis

Floods Retard Sales of Both Pig Iron and Steel—Scrap Weakens

ST. LOUIS, May 3.—High water along the Mississippi River and its tributaries is retarding deliveries of pig iron to melters serving the South and also seems to be affecting sales. The Granite City maker during the week sold 5000 tons, of which 3500 tons to Illinois and Missouri consumers was for May and June shipment, the remainder being for prompt and second quarter delivery. Buyers are disposed to enter the market without first making formal inquiries, and no sizable inquiries are pending. That stocks in hands of melters are low is indicated by the persistency with which prompt shipments are demanded. Prices are unchanged.

Prices per gross ton at St. Louis:

No. 2 fdy., sil. 1.75 to 2.25, f.o.b.	
Granite City, Ill.	..... \$20.50 to \$21.00
Northern No. 2 fdy., delivered	..... 22.16
St. Louis	..... 22.42
Southern No. 2 fdy., delivered	..... 22.16
Northern malleable, delivered	..... 22.16
Northern basic, delivered	..... 22.16

Freight rates: 81c. from Granite City to St. Louis; \$2.16 from Chicago; \$4.42 from Birmingham.

Coke.—The demand for foundry grades of coke continues only fair, with the coal strike making very little

Warehouse Prices, f.o.b. St. Louis

	Base per Lb.
Plates and structural shapes	..... 3.25c.
Bars, soft steel or iron	..... 3.15c.
Cold-finished rounds, shafting and screw stock	..... 3.75c.
Black sheets (No. 24)	..... 4.45c.
Galvanized sheets (No. 24)	..... 5.25c.
Blue annealed sheets (No. 10)	..... 3.60c.
Black corrugated sheets	..... 4.65c.
Galvanized corrugated sheets	..... 5.30c.
Structural rivets	..... 3.60c.
Boiler rivets	..... 3.80c.
	Per Cent Off List
Tank rivets, $\frac{1}{2}$ -in. and smaller	..... 70
Machine bolts	..... 60
Carriage bolts	..... 60
Lag screws	..... 60
Hot-pressed nuts, square, blank or tapped	..... 60
Hot-pressed nuts, hexagons, blank or tapped	..... 60

difference one way or another. Buying of domestic grades continues light. Prices are unchanged.

Finished Iron and Steel.—Business in all lines is being adversely affected by the floods along the Mississippi River and its tributaries. It is expected that it will be some time before farmers and other individuals in the flooded sections will be able to purchase material for replacements, but it is believed that there will be a considerable demand for steel products for municipal and Federal Government work. Railroads continue to issue emergency requisitions against contracts for track spikes and bolts for flood repairs. The sheet and plate mills of the National Enameling & Stamping Co. are operating at full capacity, while its tin mill production is now only 60 per cent of capacity, a condition due to the heavy carryover from last year of canned goods and a consequent lack of demand for tin plate by can manufacturers.

Old Material.—Dealers in this district are said to have made virtually all deliveries against existing contracts with consumers, who are not making any new contracts. This has caused added weakness in the market, and some items are off from 25c. to 50c. a ton. Because of the slow movement of old material due to the floods, dealers here have notified country shippers that sight drafts against consignments will not be paid until after the cars have reached destination. Railroads are not loading material sold to dealers because all labor is needed for flood repair work. Railroad lists include: Pennsylvania System, 50,000 tons; Baltimore & Ohio, 12,600 tons; Missouri Pacific, 5000 tons; Chicago, Burlington & Quincy, 4200 tons; Big Four lines, 3000 tons; Mobile & Ohio, 1400 tons, and St. Louis-San Francisco, 400 tons.

Prices per gross ton f.o.b. dealers' yards and delivered St. Louis district consumers' works:

Heavy melting steel.....	\$11.75 to \$12.25
Heavy shoveling steel.....	11.75 to 12.25
Miscellaneous standard-section rails, including frogs, switches and guards, cut apart.....	12.75 to 13.25
Railroad springs.....	13.50 to 14.00
Bundled sheets.....	8.50 to 9.00
No. 2 railroad wrought.....	11.75 to 12.25
No. 1 busheling.....	10.00 to 10.50
Cast iron borings.....	9.00 to 9.50
Iron rails.....	14.00 to 14.50
Rails for rolling.....	14.50 to 15.00
Machine shop turnings.....	6.75 to 7.25
Steel car axles.....	19.00 to 19.50
Iron car axles.....	23.00 to 23.50
Wrought iron bars and transoms.....	19.50 to 20.00
No. 1 railroad wrought.....	12.00 to 12.50
Steel rails, less than 3 ft.....	15.50 to 16.00
Steel angle bars.....	13.00 to 13.50
Cast iron carwheels.....	14.00 to 14.50
No. 1 machinery cast.....	18.00 to 18.50
No. 1 railroad cast.....	15.50 to 16.00
Railroad malleable.....	14.00 to 14.50
Agricultural malleable.....	13.50 to 14.00
Relaying rails, 60 lb. and under.....	20.50 to 21.00
Relaying rails, 70 lb. and over.....	26.50 to 27.00

Birmingham

High Waters Check Steel Demand—Pig Iron Buying Cautious

BIRMINGHAM, May 3.—Small-lot buying of pig iron still predominates in the Southern market, even among the larger melters purchasing for a few weeks ahead. While producers are unable to tell exactly how they stand as to forward business, the demand from week to week continues to warrant steady furnace operations. The surplus stocks of iron on furnace yards is normal, having shown no material change at the close of April from the total at the end of March. Production in Alabama made a favorable showing in April, although foundry iron output was reduced because one of the Woodward Iron Co. furnaces was put on basic. Larger melters of iron see a continuation of shop activity for 60 days at least, but do not expect to resume buying on an extensive scale until the stocks on their yards are depleted. The market remains at \$18 per ton, Birmingham, for No. 2 foundry, with no indication of an early change. Third quarter business has not been considered, and no prices have been quoted for that period.

Prices per gross ton, f.o.b. Birmingham district furnaces:

No. 2 foundry, 1.75 to 2.25 sil.....	\$18.00 to \$19.00
No. 1 foundry, 2.25 to 2.75 sil.....	18.50 to 19.50
Basic.....	18.00
Charcoal, warm blast.....	29.00

Rolled Steel.—Several open-hearth furnaces are still idle, although they are in shape for relighting whenever demand warrants it. Finishing mills are active with few exceptions. Rails and railroad accessories are moving steadily, but lighter forms of steel have been adversely affected by flood conditions in Southern States. Cotton tie manufacturing will be begun this month in earnest, and despite the inundation of some of the large cotton sections a good demand for ties is looked for. When rehabilitation begins in flooded parts of Arkansas, Mississippi and Louisiana, large quantities of wire, nails, structural steel and other finished products will be required. The Ensley rail mill is operating at close to capacity. Further business is looked for from railroads in this territory that are planning to replace lighter rails with 110-lb., 39-ft. sections. Mill prices on finished steel show no change.

Cast Iron Pipe.—New lettings of pressure pipe are coming in slowly, but unfilled tonnage will sustain steady operations at some shops at least for 60 days. The market on pressure pipe remains at \$36 to \$37, Birmingham, on 6-in. and larger sizes. Pipe production so far this year has exceeded output for the same period last year.

Coke.—Foundry coke holds at \$5.50 per net ton, Birmingham, on contracts, and at \$6 on spot purchases. A little beehive coke is still being produced; about 85 ovens are making coke for consumers who prefer the beehive product and are willing to pay \$6 per ton for it. By-product coke ovens that are not in commission are ready to start on short notice.

Old Material.—No change is noted in the market, either in demand or in quotations.

Prices per gross ton, delivered Birmingham district consumers' yards:

Heavy melting steel.....	\$12.00 to \$12.25
Scrap steel rails.....	12.50 to 13.00
Short shoveling turnings.....	8.00 to 8.50
Cast iron borings.....	8.00 to 8.50
Stove plate.....	13.00 to 14.00
Steel axles.....	16.00 to 17.00
Iron axles.....	16.00 to 17.00
No. 1 railroad wrought.....	11.00 to 12.00
Rails for rolling.....	15.00 to 16.00
No. 1 cast.....	15.00 to 16.00
Tramcar wheels.....	15.00 to 16.00
Cast iron carwheels.....	14.00 to 15.00
Cast iron borings, chemical.....	13.00 to 14.00

Cincinnati

Tennessee Pig Iron Declines—Heavy Melting Steel Down 75c.

CINCINNATI, May 3.—Although both sales and inquiries have increased slightly, the pig iron market is still dull. Consumers are specifying against second quarter contracts at only a moderate rate. In fact, many melters have enough iron on hand to supply their needs for from 30 to 60 days. With exception of a drop of 50c. a ton in Tennessee iron to \$18, base Birmingham, prices are unchanged. A few furnaces are actively soliciting third quarter business, but in almost all cases buyers are not yet ready to purchase that far ahead, preferring instead to await developments during the coming month. A Dayton, Ohio, foundry has bought 500 tons of 7 per cent silvery iron from a Jackson producer for delivery over the last half of the year. A Lake Erie furnace has taken 700 tons of foundry iron for a Piqua, Ohio, company. An Indiana melter is inquiring for 2000 tons of foundry iron, and a southern Ohio consumer is expected to contract for 1000 tons. Sales of southern Ohio foundry iron have been restricted to carload lots, while the movement of Southern iron into the territory north of the Ohio River is light. A local dealer has sold approximately 2000 tons of Southern charcoal iron to roll makers in the Pittsburgh district.

Prices per gross ton, delivered Cincinnati:

So. Ohio fdy., sil. 1.75 to 2.25.....	\$21.39 to \$21.89
So. Ohio malleable.....	20.64 to 21.89
Alabama fdy., sil. 1.75 to 2.25.....	21.69
Alabama fdy., sil. 2.25 to 2.75.....	22.19
Tennessee fdy., sil. 1.75 to 2.25.....	21.69
Southern Ohio silvery, 8 per cent.....	20.39

Freight rates: \$1.89 from Ironton and Jackson, Ohio; \$3.69 from Birmingham.

Warehouse Business.—April bookings compared favorably with those in March, but several jobbers report sales during the first four months of 1927 about 15 per cent below those in the corresponding period last year. Business has been fairly well distributed among all products, with the exception of reinforcing bars and cold-rolled steel. Prices are unchanged.

Reinforcing Bars.—Bids were taken the past week on 300 tons of bars for a warehouse for the Cincinnati Wholesale Grocery Co. Prices are soft, new billet bars ranging from 1.80c. to 1.90c., base Pittsburgh, and rail steel bars from 1.75c. to 1.80c., base mill.

Finished Material.—Demand for steel from consuming industries was sustained at a moderate rate in April, the month comparing favorably with March. Almost without exception orders and specifications called for small tonnages, but total bookings attained satisfactory proportions. The jobbing trade has been an important factor in the market, its purchases in the aggregate being large. Consideration of prices has centered principally upon the announcement of higher quotations on sheets. In line with the advance made by Eastern companies, the American Rolling Mill Co. and the Newport Rolling Mill Co. are now asking 2.25c., base Pittsburgh, for blue annealed stock, 3c. for black, 3.85c. for galvanized and 4.25c. for automobile body sheets. Operations of sheet mills in this territory continue at almost 100 per cent of capacity, and no letdown is expected in the immediate future. Activity in electrical and other special grades of sheets is pronounced. In anticipation of a normal season in roofing material, sheet metal companies have stocked substantial quantities of sheets, but their sales to date have been poor. Specifications against current contracts by automobile manufacturers have been fairly good. Bars and structural steel do not reflect the weakness that has developed in Eastern markets, the prices here remaining firm at 1.90c., base Pittsburgh. Tank plates, however, have been less active. In wire products there has been little change. Common wire nails are being sold to local jobbers at about \$2.72 a keg, delivered. Some mills are not meeting that figure, preferring instead to adhere to \$2.55, base Pittsburgh. A leading seller of cold-rolled steel states that sales have decreased approximately 15 per cent in the past few weeks.

Coke.—By-product coke companies have announced that the present price structure will not be altered during May, foundry grades selling at \$9.52 to \$9.64, delivered Cincinnati. In the domestic market, egg coke is bringing \$5, f.o.b. ovens, except in the case of an important producer who is asking 50c. less. However, walnut size will continue at \$4.50. In Michigan, by-product foundry coke is quoted at \$9.50, Detroit ovens, for outside shipment, or \$10.25, delivered in Detroit. A local dealer has booked 4000 tons of beehive furnace coke in the southern Ohio district. Otherwise, sales have been mostly in small lots. Shipments of by-product foundry coke have been somewhat less than normal, although a large foundry in the Detroit territory has more than doubled its specifications in a week.

Foundry coke prices per net ton, delivered Cincinnati: By-product coke, \$9.52 to \$9.64; Wise County coke, \$7.59 to \$8.09; New River coke, \$10.09 to \$10.59. Freight rates: \$2.14 from Ashland, Ky.; \$2.59 from Wise County and New River ovens.

Warehouse Prices, f.o.b. Cincinnati

	Base per Lb.
Plates and structural shapes.....	3.40c.
Bars, soft steel or iron.....	3.30c.
Reinforcing bars.....	3.30c.
Hoops.....	4.00c. to 4.25c.
Bands.....	3.95c.
Cold-finished rounds and hexagons	3.85c.
Squares.....	4.35c.
Open-hearth spring steel.....	4.75c. to 5.00c.
Black sheets (No. 24).....	4.05c.
Galvanized sheets (No. 24).....	4.90c.
Blue annealed sheets (No. 10)...	3.60c.
Structural rivets.....	3.85c.
Small rivets.....	.65 per cent off list
No. 9 annealed wire, per 100 lb.....	\$3.00
Common wire nails, base per keg.....	2.95
Cement coated nails, base per 100 lb. keg..	3.05
Chain, per 100 lb.....	7.55
Net per 100 Ft.	
Lap welded steel boiler tubes, 2-in.....	\$18.00
4-in.....	38.00
Seamless steel boiler tubes, 2-in.....	19.00
4-in.....	39.00

Old Material.—Heavy melting steel is off 75c. a ton, and a number of other items have decreased from 25c. to 50c. Steel plants have ample stocks to meet current needs and will buy material only if it can be secured at low prices. Curtailment of foundry operations has adversely affected the demand for foundry grades. Among the railroad lists closing this week are the Big Four, 2800 tons; the Pennsylvania, 46,000 tons, and the Central of Georgia, 1445 tons.

Dealers' buying prices per gross ton, f.o.b. cars, Cincinnati:

Heavy melting steel.....	\$12.25 to \$12.75
Scrap rails for melting.....	13.25 to 13.75
Loose sheet clippings.....	9.00 to 9.50
Champion bundled sheets.....	10.00 to 10.50
Cast iron borings.....	9.25 to 9.75
Machine shop turnings.....	8.50 to 9.00
No. 1 busheling.....	10.00 to 10.50
No. 2 busheling.....	7.50 to 8.00
Rails for rolling.....	14.00 to 14.50
No. 1 locomotive tires.....	16.50 to 17.00
No. 1 railroad wrought.....	12.00 to 12.50
Short rails.....	17.50 to 18.00
Cast iron carwheels.....	13.00 to 13.50
No. 1 machinery cast.....	18.00 to 19.00
No. 1 railroad cast.....	14.50 to 15.00
Burnt cast.....	8.50 to 9.00
Stove plate.....	10.00 to 10.50
Brake shoes.....	10.50 to 11.25
Railroad malleable.....	14.00 to 14.50
Agricultural malleable.....	13.50 to 14.00

Toronto

Canadian Imports of Pig Iron Increasing—Scrap Trade Is Quiet

TORONTO, ONT., May 3.—Pig iron sales in small-tonnage lots for spot delivery continue satisfactory in Canadian markets, but little ordering is being done on future account. With the majority of large consumers covered for this quarter, there is little prospect of any general improvement in future buying for from four to six weeks. Producers are apparently not encouraging melters to place long-term contracts, most of them being reluctant to accept business past the end of June. The opening of navigation on the Great Lakes and up the St. Lawrence has been a factor in favor of pig iron producers, especially with the low prices now prevailing. Water shipments make a difference of from \$2 to \$3 per ton as compared with rail hauls, thus giving the producers that much more leeway in iron costs. Imports from the United States are increasing over those of the first month or two of this year, and it is expected that larger tonnages will be reaching this country from Great Britain and the Continent.

Prices per gross ton:

Delivered Toronto	
No. 1 foundry, sil. 2.25 to 2.75.....	\$24.10
No. 2 foundry, sil. 1.75 to 2.25.....	24.10
Malleable.....	24.10
Delivered Montreal	
No. 1 foundry, sil. 2.25 to 2.75.....	26.50
No. 2 foundry, sil. 1.75 to 2.25.....	26.50
Malleable.....	26.50
Basic.....	25.50
Imported Iron at Montreal Warehouse	
Summerlee.....	36.00
Carron.....	36.00

Old Material.—The market has failed to show improvement. Sales are confined almost entirely to small tonnages for immediate needs of consumers, with little or no future contract placing. Small consumers are entering the market at frequent intervals, and in some instances tonnages called for in spot orders are larger than formerly. Shipments against contracts are accounting for a good movement of scrap, especially to the Hamilton district.

Dealers' buying prices:

	Toronto	Montreal
Per Gross Ton		
Heavy melting steel.....	\$10.50	\$9.00
Rails.....	11.00	10.00
No. 1 wrought.....	11.00	14.00
Machine shop turnings.....	8.00	7.50
Boiler plate.....	8.00	8.00
Heavy axle turnings.....	8.50	7.50
Cast borings.....	8.50	8.00
Steel turnings.....	8.00	6.00
Wrought pipe.....	6.00	17.00
Steel axles.....	15.00	19.00
Axles, wrought iron.....	17.00	
Per Net Ton		
No. 1 machinery cast.....	16.00	18.00
Stove plate.....	10.00	13.00
Standard carwheels.....	14.00	16.00
Malleable scrap.....	14.00	14.00

Boston

Imports of Indian Pig Iron Resumed —Foundry Coke Reduced 50c.

BOSTON, May 3.—Imports of Indian pig iron have been resumed, but on a limited scale. Larger tonnages most likely will come later, for importers are offering this iron to all foundries in the market. The weakness in pig iron prices which developed a week or ten days ago is attributed in part to the resumption of imports and in part to solicitation for business by a New York State furnace that is increasing production in an effort to reduce production costs. There is hardly enough passing business, however, to establish market prices. According to report here a West Springfield, Mass., foundry in the past week bought 500 tons of No. 2X for June delivery from a furnace east of Buffalo at a delivered price considerably under \$23 a ton. There are no open inquiries in the market for lots of 100 tons or more. The New England melt is just about holding its own. Gains by some foundries are offset by decreased melt by others. A Massachusetts maker of heaters is melting more than 90 tons a day, which from all reports received appears to be the largest individual melt in these States.

Prices of foundry iron per gross ton, delivered to most New England points:

Buffalo, sil. 1.75 to 2.25.....	\$22.41 to \$22.91
Buffalo, sil. 2.25 to 2.75.....	22.91 to 23.41
East. Penn., sil. 1.75 to 2.25.....	24.15 to 24.65
East. Penn., sil. 2.25 to 2.75.....	24.65 to 25.15
Virginia, sil. 1.75 to 2.25.....	27.42
Virginia, sil. 2.25 to 2.75.....	27.92
Alabama, sil. 1.75 to 2.25.....	24.91 to 26.77
Alabama, sil. 2.25 to 2.75.....	25.41 to 27.27

Freight rates: \$4.91 from Buffalo, \$3.65 from eastern Pennsylvania, \$5.92 from Virginia, \$6.91 to \$8.77 from Alabama.

Coke.—New England by-product ovens have reduced foundry coke 50c. a ton to \$12 a ton, delivered, within a \$3.10 freight rate zone. April deliveries were somewhat smaller than those in March, and May is starting with comparatively light specifications. Connellsville foundry coke is still available at delivered prices under those for New England coke, but sales are limited.

Finished Products.—The market for plates appears firmer than that for structural shapes. On attractive tonnages for prompt shipment, standard shapes have been offered at 1.75c. per lb., on cars, Pittsburgh, while 1.85c. appears to be the lowest price offered on plates. Fabricators are figuring on more jobs than they were a month ago, but most of them call for small tonnages of steel.

Imports.—During April 110 tons of 6 per cent sili-con pig iron arrived here from India, the first consignment from that country since August, 1926. A fair tonnage of Dutch iron, landed in Boston in February, was the last previous importation. Imports of iron ore in April consisted of 6050 tons from Bona and 7075 tons from Bizerta, a total of 13,125 tons, which compares with 13,527 tons imported in March. Imports of cast iron pipe totaled 2856 pieces, made up of 1362 pieces from France and 2856 pieces from Antwerp. In March, 5209 pieces of pipe were landed here.

Warehouse Prices, f.o.b. Boston

	Base per Lb.
Plates	3.365c.
Structural shapes—	
Angles and beams.....	3.365c.
Tees	3.365c.
Zees	3.465c.
Soft steel bars and small shapes.....	3.265c.
Flats, hot-rolled	4.15c.
Reinforcing bars	3.265c. to 3.54c.
Iron bars—	
Refined	3.265c.
Best refined	4.60c.
Norway, rounds	6.60c.
Norway, squares and flats.....	7.10c.
Spring steel—	
Open-hearth	5.00c. to 10.00c.
Crucible	12.00c.
Tire steel	4.50c. to 4.75c.
Bands	4.015c. to 5.00c.
Hoop steel	5.50c. to 6.00c.
Cold rolled steel—	
Rounds and hexagons.....	4.05c.
Squares and flats.....	4.55c.
Toe calk steel.....	6.00c.

Cast Iron Pipe.—Cambridge, Mass., has awarded 100 tons of 4 to 12-in. pipe to a local company. R. D. Wood & Co. were the low American bidders on the Bridge-water, Mass., business and will probably be awarded the contract. Revere, Mass., opened bids April 29 on 275 tons of 12-in. pipe but has made no award. No other open municipal business has been placed or has come out for bids. Private bookings continue fairly heavy, however, for the past week, approximating 5000 tons of water pipe in addition to a round tonnage of gas pipe. The price situation remains unchanged. Foundries are holding firmly on small pipe but are offering concessions on large sizes. Openly quoted domestic prices follow: 4-in., \$58.10 a ton, delivered common Boston freight rate points; 6 to 12-in., \$53.10 to \$54.10; larger pipe, \$52.10 to \$53.10. A \$5 differential is asked on Class A and gas pipe.

Warehouse Business.—Individual orders placed with warehouses for material continue on a hand-to-mouth basis; yet the weekly turnover runs into fairly large tonnages. Competition for business is keener than at any previous period this year, and price concessions are frequently made on bars, plates, sheets, structural steel and most other products handled. Concessions on reinforcing bars are, perhaps, larger than on most other kinds of material. The openly quoted price is \$2.90 per 100 lb., but most sales are at \$2.75, base.

Old Material.—The movement of steel mill material out of New England in the past week was even smaller than for the previous week and established a new low record for 1927. The market naturally is unsettled. No real drop in quotations is noted for heavy melting steel, wrought, borings, mixed borings and turnings, forged scrap or scrap rails. Specification pipe, however, is easily 50c. a ton lower; steel turnings, 25c., and long bundled skeleton, forged flashings and shafting, 50c. The status of the market in textile machinery cast is difficult to establish. For instance, one of the largest dealers is freely offering selected stock at \$16 a ton, delivered, with few takers. In contrast, sales were made the past week at \$17. The wide spread in prices is attributed to the unusually large tonnage available and the anxiety on the part of some dealers to sell. The market for machinery cast is easier, and quotations on malleable have dropped all of \$1 a ton.

Buying prices per gross ton, f.o.b. Boston rate shipping points:

No. 1 heavy melting steel.....	\$9.75 to \$10.00
Scrap rails	9.50 to 10.00
No. 1 railroad wrought.....	11.50 to 12.00
No. 1 yard wrought.....	10.00 to 10.25
Machine shop turnings.....	6.00 to 6.25
Cast iron borings (steel works and rolling mill).....	7.00 to 7.50
Bundled skelton, long.....	7.00 to 7.50
Forged flashings	7.00 to 7.50
Blast furnace borings and turnings	4.00 to 6.25
Forged scrap	4.50 to 7.00
Shafting	14.00 to 14.50
Street car axles	15.00 to 15.50
Wrought pipe (1 in. in diameter, over 2 ft long).....	8.00 to 8.50
Rails for rerolling.....	11.00 to 11.50
Cast iron borings, chemical.....	10.50 to 11.00

Prices per gross ton, delivered consumers' yards:

Textile cast	\$16.00 to \$17.00
No. 1 machinery cast.....	16.00 to 16.50
No. 2 machinery cast.....	14.50 to 15.00
Stove plate	12.50 to 13.00
Railroad malleable	15.00 to 15.50

Buffalo

Mill Operations Show Slight Gain— Inquiry for 4000 Tons of Pig Iron

BUFFALO, May 3.—Inquiry for pig iron is in fair volume. Foundries are not very busy, and the placement of tonnage is on a limited scale. The General Electric Co., Schenectady, N. Y., is reported to be in the market for 2000 tons of basic and 2000 tons of Bessemer grade. Another inquiry, for 1000 tons of foundry, comes from outside the district. Low prices seem to have been withdrawn rather generally, and it is believed that only on very desirable business would lower than \$18, base, be done. Furnaces are ready to sell

for third quarter, but so far there has been comparatively little demand.

Prices per gross ton, f.o.b. Buffalo furnace:

No. 2 plain fdy., sil. 1.75 to 2.25..	\$17.50 to \$18.00
No. 2X foundry, sil. 2.25 to 2.75..	18.00 to 18.50
No. 1X foundry, sil. 2.75 to 3.25..	19.00 to 19.50
Malleable, sil. up to 2.25.....	17.50 to 18.00
Basic	17.50 to 17.75
Lake Superior charcoal.....	27.28

Finished Iron and Steel.—Mills are operating at around 75 per cent, having increased slightly during the week. Bars and shapes are fairly active, with some good specifications being received. These products are ordinarily commanding 2.165c., Buffalo, with 2.065c. occasionally done on especially desirable tonnage. The sheet market shows improvement, with No. 24 gage black considerably firmer. Reinforcing bar contracts taken include one for 260 tons for a local school, which went to a Buffalo maker. A subway in Rochester will

Warehouse Prices, f.o.b. Buffalo

	Base per Lb.
Plates and structural shapes.....	3.40c.
Soft steel bars.....	3.30c.
Reinforcing bars	2.75c.
Cold-finished flats, squares and hexagons	4.45c.
Rounds	3.95c.
Cold rolled strip steel.....	5.85c.
Black sheets (No. 24).....	4.30c.
Galvanized sheets (No. 24).....	5.15c.
Blue annealed sheets (No. 10).....	3.80c.
Common wire nails, base per keg.....	\$3.90
Black wire, base per 100 lb.....	3.90

require an additional 250 tons of reinforcing bars. Plans for the Victor Building, Buffalo, calling for 400 tons, are being redrawn.

Old Material.—Mills are apparently a little busier and consumption of scrap is heavy, but there have been no large orders placed. Three of the mills have been doing some buying of heavy melting steel. One paid \$15.50, or approximately that, for No. 1 grade; another has paid \$15 for the grade that it uses. No large tonnages are going to the latter mill, and many cars are being rejected for not complying strictly with mill specifications. There has been some selling of No. 1 machinery cast, and there is a strong demand for stove plate, which is scarcer than it has been for years. The market in low phosphorus is considerably quieter.

Prices per gross ton, f.o.b. Buffalo consumers' plants:

Basic Open-Hearth Grades	
No. 1 heavy melting steel.....	\$15.50 to \$16.00
No. 2 heavy melting steel.....	14.50 to 15.00
Scrap rails	16.00 to 16.50
Hydraulic compressed sheets....	14.50 to 15.00
Hand-bundled sheets	11.00 to 11.50
Drop forge flashings.....	13.00 to 13.50
No. 1 busheling.....	14.50 to 15.00
Heavy steel axle turnings.....	14.00 to 14.50
Machine shop turnings.....	9.00 to 9.50
Acid Open-Hearth Grades	
Railroad knuckles and couplers..	17.50 to 18.00
Railroad coil and leaf springs...	17.50 to 18.00
Rolled steel wheels.....	17.50 to 18.00
Low phosphorus billet and bloom ends	17.50 to 18.00
Electric Furnace Grades	
Heavy steel axle turnings.....	14.00 to 14.50
Short shoveling steel turnings...	11.50 to 12.00
Blast Furnace Grades	
Short shoveling steel turnings...	11.50 to 12.00
Short mixed borings and turnings	10.00 to 10.50
Cast iron borings.....	11.00 to 11.50
No. 2 busheling.....	13.50 to 14.00
Rolling Mill Grades	
Steel car axles.....	17.00 to 17.50
No. 1 railroad wrought.....	13.00 to 13.50
Cupola Grades	
No. 1 machinery cast.....	16.50 to 17.00
Stove plate	14.00 to 14.50
Locomotive grate bars.....	13.00 to 13.50
Steel rails, 3 ft. and under.....	18.00 to 18.50
Cast iron carwheels.....	15.00 to 16.00
Malleable Grades	
Railroad	16.50 to 17.00
Agricultural	16.50 to 17.00
Industrial	16.50 to 17.00

Winter, Wolff & Co., iron and steel importers, have moved from 42 Broadway to the new Transportation Building, 225 Broadway, New York.

Hoffman & Scofield, Inc., dealer in sheets, tin plate and non-ferrous metals, has moved from 98 Beekman Street to larger quarters at 64-66 Cliff Street, New York.

New Pig Iron Rates Regarded as Unfavorable to Cleveland

CLEVELAND, May 3.—Pig iron producers in the Cleveland district are disappointed with the order of the Interstate Commerce Commission upholding the changes in freight rates on pig iron in Central Freight Association territory that were proposed by the railroads and later suspended by the commission until May 31. The effect of the new rates, which embrace both reductions and advances, will be unfavorable to the Cleveland producers, because there will be advances to many important consuming points in Indiana and to a few points in Michigan over the present rates of the Wheeling & Lake Erie Railway, although no changes will be made in the rates of some of the other carriers that have higher rates than the Wheeling & Lake Erie. Local shippers regard the new rates as favorable to Ironton district furnaces.

The rate from Detroit is advanced 25c. a ton to some points in northern Indiana. Toledo furnaces are favored to the extent that the higher rates from Cleveland will make it a little harder for Cleveland furnaces to reach the northern Indiana territory. While there are some minor changes in the rates from Toledo to Indiana points, they will average about the same as at present.

The decision of the Interstate Commerce Commission upholds the rates of the carriers with three exceptions. A proposed advance from Chicago to Benton Harbor was ordered canceled. A proposed reduction from Chicago to Huntington, Wabash and Goshen, Ind., was ordered canceled, keeping the rate to those points the same as from Toledo. Cancellation of a proposed advance from Toledo to consumers in the Logansport, Ind., group of towns was also ordered.

The commission upheld the present \$1 rate on pig iron over the Detroit, Toledo & Ironton Railroad between Toledo and Detroit, thus not requiring that road to advance its rate to \$1.40, which is charged by other carriers between the two points. It also upheld the present \$2.75 rate from Cleveland to Detroit.

The Ohio Public Utilities Commission is expected to issue its decision within a day or two upon intrastate rates on pig iron, which are involved in the whole subject of pig iron rate fixing in this territory, and the ruling on the intrastate rates will be of even more importance to Ohio producers than the decision on the interstate rates. Some time ago the Ohio commission suspended advances in pig iron rates in Ohio that the Ohio roads sought to place in effect, but did not suspend the reduction that those roads had made on other intrastate pig iron rates.

Shipments of Fire Apparatus

Motor-driven apparatus for extinguishing fires was shipped in March to the extent of 87 pumping engines and 36 other types, compared with 61 and 26 respectively in February, and with 67 and 43 in March of last year. The current figures are the greatest since December. They include 38 engines of 700 gal. per min. capacity, or more; 17 of 500 to 700 gal. and 32 under 500 gal., together with 13 chemical engines, 10 combination chemical and hose, 2 hose carts, 7 city service hook-and-ladder units, and 4 aerial hook-and-ladder.

In addition to the foregoing, the shipments of hand types included 21,053 of the soda-acid type, 1130 of the hand pump type, and 26,267 of the carbon tetra-chloride type. Shipments of the hand equipment were the greatest since August.

Scrapping of old automobiles is proceeding at a rapid rate, according to *Automotive Industries*, and indications are that the number of vehicles thus removed from the registration lists will exceed this year the mark of over 2,000,000 reached in 1926. It is estimated that in 1927 approximately 75 cars will be removed from service for every 100 new ones sold.

Southern Steel & Rolling Mill, Inc., Birmingham, will shortly start up its spike department. The main mill is producing reinforced concrete bars and angles.

FABRICATED STRUCTURAL STEEL

Awards Are Close to 33,000 Tons and Inquiries Slightly Under 20,000 Tons

Compared with the weeks just preceding, the past week showed less activity in lettings of structural steel, the total, as reported to **THE IRON AGE**, being about 33,000 tons. Inquiries were a little under 20,000 tons. The largest award was 5000 tons for a gas holder at Long Beach, Cal. Awards follows:

CLEVELAND, Cleveland Club, 2200 tons, to an unnamed fabricator.
 ROCHESTER, N. Y., 1800 tons, subway, to F. L. Hughes Co.
 ROCHESTER, 1400 tons, *Rochester Times Union* building, to Genesee Bridge Co.
 TULSA, OKLA., 500 tons, gas company building, to Kansas City Structural Steel Co.
 RUTLAND, VT., 300 tons, Colonial Marble Co. plant, to Eastern Bridge & Structural Co.
 BANGOR, 350 tons, parochial school, to unnamed fabricator.
 HARTFORD, CONN., 140 tons, city bridge, to Boston Bridge Works, Inc.
 NEW MILFORD, CONN., 300 tons, power house, to Berlin Construction Co.
 SPRINGFIELD, MASS., 125 tons, to unnamed fabricator.
 NEW YORK, 9372 tons in the following awards as reported to the Structural Steel Board of Trade, Inc.: 16-story apartment hotel, 148 East Thirty-ninth Street, and 18-story loft building, 42-50 West Thirty-ninth Street, and 18-story loft building, Ninth Avenue and Thirty-fifth Street, to Hay Foundry & Iron Works; boiler frame No. 4, Thirty-fifth Street and East River Station, New York Steam Corporation, to Post & McCord; garage, Tenth Avenue, Thirty-third and Thirty-fourth Streets; theater, Jamaica Avenue and Springfield Boulevard, Queens Village, and theater, 574 Flatbush Avenue, Brooklyn, to George A. Just Co.
 STATE OF NEW YORK, 150 tons, highway bridge, to American Bridge Co.
 ROME, N. Y., 250 tons, mill addition for Rome Wire Co., to R. S. McMannus Steel Construction Co.; John W. Cowper Co., Buffalo, general contractor.
 PENNSYLVANIA RAILROAD, 700 tons, pier on North River, New York, to American Bridge Co.
 NAZARETH, PA., 250 tons, mill building for Nazareth Cement Co., to Bethlehem Construction Co.
 LANGELOTH, PA., 130 tons, American Metals Co. building, to Pittsburgh Bridge & Iron Co.
 ROXBORO, PA., 160 tons, hospital, to Bethlehem Fabricators, Inc.
 CHESAPEAKE & OHIO RAILROAD, 1400 tons, bridges, to Mount Vernon Bridge Co.
 ERIE RAILROAD, 550 tons, bridge at Paterson, N. J., to Bethlehem Steel Co.
 WILMINGTON, DEL., 350 tons, apartment building, to McClintic-Marshall Co.
 BALTIMORE, 150 tons, incinerator plant for the city of Baltimore, to Bethlehem Construction Co.
 OAKWOOD, MICH., 500 tons, bridge for Wabash Railroad, to American Bridge Co.
 HOOPERSTON, ILL., 200 tons, building for Vermillion Malleable Iron Works, to Mississippi Valley Structural Steel Co.
 CHICAGO, 105 tons, building for the Koppers Co., to Gage Structural Steel Co.
 CHICAGO, 225 tons, bridge work for Chicago & Alton, the Burlington and the Chicago & North Western Railroads, to Vlerling Steel Works.
 CHICAGO, 1000 tons, power house addition for Commonwealth Edison Co., to McClintic-Marshall Co. and not American Bridge Co. as previously reported.
 CEDAR RAPIDS, IOWA, 1000 tons, two theaters, to Iowa Steel & Iron Co., local.
 SIOUX FALLS, S. D. 350 tons, packing plant, to Pittsburgh-Des Moines Steel Co.
 PORTLAND, ORE., 125 tons, dome for Temple Beth Israel, to Pacific Iron Works, Portland.
 PORTLAND, 160 tons, Grant High School, to Pacific Iron Works.
 PORTLAND, 100 tons, Errol Heights School, to Pacific Iron Works.
 PORTLAND, 1224 tons, garage and warehouse for Meier & Frank, to Poole & McGonigle, Portland.
 LONG BRACH, CAL., 5000 tons, municipal gas holder, to Stacy Brothers Gas Construction Co., Cincinnati.
 RAMONA, CAL., 100 tons, riveted pipe line for Ramona Irrigation District, to Western Pipe & Steel Co., San Francisco.
 MONTEREY PARK, CAL., 120 tons, welded pipe line, to Western Pipe & Steel Co.
 SAN FRANCISCO, 2100 tons, penstock for the Bucks Creek

project for the Feather River Power Co., to Western Pipe & Steel Co.

SAN FRANCISCO, 799 tons, penstocks for the Pacific Gas & Electric Co.; 550 tons at Cowie, Cal., to Western Pipe & Steel Co., and 249 tons at Staulding, Cal., to Steel Tank & Pipe Co.

Structural Projects Pending

Inquiries for fabricated steel work include the following:

CLEVELAND, 2000 tons, wings for public auditorium; new bids asked.
 CLEVELAND, 1900 tons, Cleveland Union Terminals Co., Prospect Avenue bridge.
 CLEVELAND, 200 tons, plant for Smith Incubator Co.
 MINNEAPOLIS, MINN., 1000 tons, field building for University of Minnesota; Minneapolis Steel & Machinery Co., low bidder.
 PROVIDENCE, R. I., 1000 tons, theater and stores, Marcus Loew's, Inc.
 WELLESLEY, MASS., 100 tons, printing plant.
 NEWARK, N. J., 100 tons, Fox theater.
 NEW YORK CENTRAL RAILROAD, 200 tons, miscellaneous work at Weehawken, N. J.
 CHESAPEAKE & OHIO RAILROAD, 100 tons, bridge.
 JERSEY CITY, N. J., 150 tons, Commercial Trust Co. building.
 NYACK, N. Y., 100 tons, Y. W. C. A. building.
 READING, PA., 500 tons, building for Reading Railroad Y. M. C. A.
 ERIE RAILROAD, 1300 tons, bridges.
 WASHINGTON, 3250 tons for 25 barges for Inland Waterways Corporation; bids open May 16.
 CHICAGO, 500 tons, garage for Dinkleburg Syndicate.
 CHICAGO, 1500 tons, bridges for the South Park Board.
 CHICAGO, tonnage being estimated, LaSalle Club.
 CHICAGO, tonnage being estimated, administration building for Chicago Public School Board.
 KOKUK, IOWA, 500 tons, addition to power plant of Mississippi River Power Co.
 STATE OF MINNESOTA, 925 tons, State highway bridges.
 ST. LOUIS, 144 tons, Bishop Tuttle Memorial Building.
 ST. LOUIS, 1330 tons, 12 barges for Mississippi River Commission; bids open May 14.
 PUEBLO, COLO., 500 tons, addition to open-hearth plant of Colorado Fuel & Iron Co.
 NAPA, CAL., 120 tons, bridge to replace trestle draw bridge for the Southern Pacific Co., San Francisco; bids in about six weeks.
 SAN FRANCISCO, 800 tons, boxing arena, Post and Steiner Streets; bids in about 60 days.
 PORTLAND, ORE., 1552 tons, Broadway bridge and Lovejoy viaduct; bids in.
 TALENT, ORE., 100 tons, welded pipe line for the Talent Irrigation District; bids in.
 LOS ANGELES, 164 tons, bridge for the San Gabriel Railroad for the Los Angeles County Flood Control District; Virginia Bridge & Iron Co., low bidder.
 BEVERLY HILLS, CAL., 160 tons, riveted pipe line; bids May 9.

RAILROAD EQUIPMENT

Illinois Central Inquires for 4500 Cars and 15 Locomotives—Erie for 50 Engines

The inquiry of the Illinois Central for freight cars was issued a few days ago, calling for 4500 of various types. This road also is in the market for 15 locomotives and the Erie has inquired for 50. The Chicago & Illinois Midland is asking for bids on 350 cars. Details of the week's orders and inquiries follow:

The Erie Railroad has inquired for 50 locomotives.

The Illinois Central will take bids on 15 8-wheel switch-locomotives.

The inquiry of the Illinois Central for 4500 cars, expected for some weeks but which, it was announced, would be postponed because of the Mississippi Valley flood conditions, was unexpectedly issued a few days ago. It calls for bids on 2500 box cars, 1000 gondolas, 700 50-ton and 300 70-ton hopper cars and 500 flat cars. This railroad is also asking for 10 baggage express and 6 baggage mail cars.

The Chicago & Illinois Midland has inquired for 350 70-ton steel gondola cars and 6 passenger cars.

The American Sugar Refining Co. has ordered 125 sugar cane cars from the Magor Car Corporation.

The Chicago, Rock Island & Pacific is in the market for 100 underframes.

The Fruit Growers Express is inquiring for 651 underframes for refrigerator cars.

The Guantanamo Sugar Co. has ordered 30 box cars and 2 air dump cars from the Magor Car Corporation.

The Rock Island has purchased 100 underframes for ice cars from the Bettendorf Co.

NON-FERROUS METAL MARKETS

**The
Week's
Prices**

Cents per Pound
for
Early Delivery

	May 3	May 2	Apr. 30	Apr. 29	Apr. 28	Apr. 27
Lake copper, New York....	13.12½	13.12½	13.12½	13.12½	13.12½	13.12½
Electrolytic copper, N. Y.*	12.75	12.75	12.75	12.75	12.75	12.75
Straits tin, spot, New York.	67.00	67.00	66.12½	66.25	66.62½	67.12½
Lead, New York.....	6.75	6.75	6.80	6.80	6.85	6.87½
Lead, St. Louis.....	6.40	6.40	6.45	6.45	6.55	6.57½
Zinc, New York.....	6.47½	6.47½	6.47½	6.47½	6.47½	6.47½
Zinc, St. Louis.....	6.12½	6.12½	6.12½	6.12½	6.12½	6.12½

*Refinery quotation; delivered price ¼c. higher.

NEW YORK, May 3.—Except for tin, demand has been small and the price tendency in most of the metals has been lower. The copper market has been stagnant with quotations a little lower but firm. Fairly heavy sales have been made in tin with little change in the average price. Further sharp reductions have been made in lead with buying light. There has been no activity in zinc but prices have remained unchanged.

Copper.—Consumers and producers have come to a standoff and there has been almost no buying during the week. Prices for electrolytic copper have fallen virtually ½c. to 13c., delivered in the Connecticut Valley, from the nominal quotation of 13.12½c. prevailing a week ago. The metal was obtainable at 13c. on April 27 from one or two producers and since then practically all sellers have come to the same level. Consumers are well covered and, though they are watching the market carefully, they are reported as indifferent. The position of some rolling mill and other consumers is not good as to orders as it was recently. Copper Exporters, Inc., on April 27 reduced its quotation from 13.50c. to 13.35c. c.i.f. Hamburg, the price prevailing previous to the last advance. Inquiry for export is better today, but the market has been very dull for the last week. The opinion is expressed that the market may remain sluggish until the statistics for April appear in about two weeks. These should be favorable to sellers provided the volume of consumption has not in the meantime decidedly contracted. Lake copper is quoted at 13.12½c., delivered.

Copper Averages.—The average price of Lake copper for the month of April, based on daily quotations in THE IRON AGE was 13.18c. delivered. The average price of electrolytic copper was 12.81c., refinery, or 13.06c., delivered in the Connecticut Valley.

Tin.—Sales for the week, ended and including Saturday, April 30, were about 1000 tons, with the larger part of this taken by consumers who were more interested than for some time. They are, however, apparently well covered for May and June and are interested principally in July-August metal. The market as a whole has been easy the entire week. On the publication of the statistics for April yesterday, it firmed up. Though it was dull up to the close of the day, 300 tons was bought by dealers yesterday. April statistics were expected to show a decrease in the world's visible supply of 1200 to 1500 tons. The actual data put the decrease at 1503 tons. Straits shipments were large at 6053 tons to all countries, but the Banca shipments were way down, or only 698 tons to all countries; in March they were 1206 tons and a year ago in April they were 1629 tons. It is known that the Dutch Government, which controls this grade of tin, has allowed shipments of only enough to cover mere budget requirements, the consideration being a revenue proposition only. Prices in London were lower today than yesterday, but higher than a week ago, with spot standard quoted at £297, future standard at £288 15s. and spot Straits at £310 per ton. The Singapore price today is £297 10s. Over there the premium on spot standard is again increasing, due, it is believed, to increasing orders from the United States. This may mean more imports of English tin into this country. In this market spot Straits tin today was quoted at 67c., New York, with activity only moderate. April statistics show deliveries into con-

Metals from New York Warehouse

Delivered Prices Per Lb.

Tin, Straits pig.....	68.00c. to 69.00c.
Tin, bar	71.00c. to 72.00c.
Copper, Lake	14.25c.
Copper, electrolytic	14.00c.
Copper, casting	13.50c.
Zinc, slab	7.12½c. to 8.12½c.
Lead, American pig.....	8.12½c. to 8.67½c.
Lead, bar	10.12½c. to 11.12½c.
Antimony, Asiatic	16.00c. to 16.50c.
Aluminum No. 1 ingot for remelting (guaranteed over 99 per cent pure) ..	29.00c. to 30.00c.
Babbitt metal, commercial grade ..	30.00c. to 40.00c.
Solder, ½ and ½	42.00c. to 43.00c.

Metals from Cleveland Warehouse

Delivered Prices Per Lb.

Tin, Straits pig.....	70.50c.
Tin, bar	72.50c.
Copper, Lake	14.00c.
Copper, electrolytic	14.00c.
Copper, casting	13.25c.
Zinc, slab	8.00c.
Lead, American pig.....	8.00c.
Antimony, Asiatic	19.50c.
Lead, bar	10.00c.
Babbitt metal, medium grade.....	23.25c.
Babbitt metal, high grade.....	74.00c.
Solder, ½ and ½	42.50c.

Rolled Metals from New York or Cleveland Warehouse

Delivered Prices, Base Per Lb.

Sheets—	
High brass	18.12½c. to 18.87½c.
Copper, hot rolled.....	21.75c. to 22.75c.
Copper, cold rolled, 14 oz. and heavier, ..	24.00c. to 25.00c.
Seamless Tubes—	
Brass	23.00c. to 24.00c.
Copper	23.75c. to 24.75c.
Brazed Brass Tubes.....	25.87½c. to 26.87½c.
Brass Rods	15.87½c. to 16.87½c.

From New York Warehouse

Delivered Prices, Base Per Lb.

Zinc sheets (No. 9), casks.....	11.00c. to 11.25c.
Zinc sheets, open.....	12.00c. to 12.25c.

Non-Ferrous Rolled Products

Mill prices on bronze, brass and copper products have not changed since the reduction of April 8. Zinc sheet and lead full sheets are still being quoted at the change of April 25.

List Prices, Per Lb., f.o.b. Mill

On Copper and Brass Products, Freight up to 75c. per 100 Lb. Allowed on Shipments of 500 Lb. or Over.

Sheets—	
High brass	18.12½c.
Copper, hot rolled.....	21.75c.
Zinc	9.75c.
Lead (full sheets).....	10.50c. to 10.75c.

Seamless Tubes—	
High brass	23.00c.
Copper	23.75c.

Rods—	
High brass	15.87½c.
Naval brass	18.62½c.

Wire—	
Copper	15.00c.
High brass	18.62½c.
Copper in Rolls.....	20.62½c.
Brazed Brass Tubing.....	26.12½c.

Aluminum Products in Ton Lots

The carload freight rate is allowed to destinations east of the Mississippi River and also allowed to St. Louis on shipments to destinations west of that river.

Sheets, 0 to 10 gage, 3 to 30 in. wide.....	35.50c.
Tubes, base	45.00c.
Machine rods	34.00c.

Rolled Metals, f.o.b. Chicago Warehouse (Prices Cover Trucking to Customers' Doors in City Limits)

Sheets—	Base per Lb.
High brass	19.12½c.
Copper, hot rolled.....	21.75c.
Copper, cold rolled, 14 oz. and heavier.....	24.00c.
Zinc	11.50c.
Lead, wide	10.25c.
Seamless Tubes—	
Brass	24.50c.
Copper	25.25c.
Brazed Brass Tubes.....	28.37½c.
Brass Rods	15.87½c.

sumption to have been 6720 tons with 1704 tons in stock and landing April 30.

Lead.—Production is still in excess of consumption, which is the key to the market, and prices have again been lowered. During the week the leading interest reduced its New York contract price twice; on April 28 from 7c. to 6.85c. and on May 2 to 6.75c. In the outside market quotations stand at 6.40c., St. Louis. One opinion is to the effect that it would cost 7.17½c. to import lead bearing ore, subject to the 1½c. duty. The price here is now 6.75c., which is so much below the London level that that market is no longer a threat. It is figured that the price there must drop £2 per ton to be a menace. For several years the New York market has been influenced by that of London, but it is now regarded as divorced. Consuming demand continues very light.

Zinc.—Ore prices again declined to \$40 per ton, Joplin, on Saturday, but production is still high. Prices of prime Western, however, have not been affected except that the cheaper ore is in their favor. Quotations are practically the same as a week ago at 6.12½c., St. Louis, or 6.47½c., New York, for early delivery. Sellers are not pressing the market and consumers are not eager to buy, total transactions having been light for the week.

Antimony.—Supplies are either more ample or

Old Metals, Per Pound, New York

The buying prices represent what large dealers are paying for miscellaneous lots from the smaller accumulators, and the selling prices are those charged consumers after the metal has been properly prepared for their uses.

	Dealers' Buying Prices	Dealers' Selling Prices
Copper, heavy crucible.....	11.25c.	12.50c.
Copper, heavy and wire.....	11.00c.	12.00c.
Copper, light and bottoms...	9.25c.	10.75c.
Brass, heavy	7.00c.	8.50c.
Brass, light	6.00c.	7.50c.
Heavy machine composition.	8.75c.	10.125c.
No. 1 yellow brass turnings.	7.75c.	8.50c.
No. 1 red brass or composition turnings	8.00c.	9.00c.
Lead, heavy	5.25c.	5.875c.
Lead, tea	4.25c.	4.75c.
Zinc	4.00c.	4.25c.
Sheet aluminum	15.00c.	17.00c.
Cast aluminum	15.00c.	17.00c.

dealers are more anxious to sell, for Chinese metal is now quoted at 13c., New York, duty paid, for all positions. It is stated that in the second quarter, average quotations are usually the lowest of the year.

Nickel.—Quotations are unchanged with ingot nickel in wholesale lots quoted at 35c., with shot nickel at 36c. and electrolytic nickel at 39c. per lb.

Aluminum.—Virgin metal, 98 to 99 per cent pure, is quoted at 26c. per lb., delivered.

Non-Ferrous Metals at Chicago

MAY 3.—This market is quiet and prices, with the exception of copper, are lower. There is little or no demand for old metals and prices are weak.

We quote in carload lots: Lake copper, 13.25c.; tin, 68c.; lead, 6.60c.; zinc, 6.25c.; in less than carload lots, antimony, 15.50c. On old metals we quote copper wire, crucible shapes and copper clips, 10.25c.; copper bottoms, 9c.; red brass, 9c.; yellow brass, 7.25c.; lead pipe, 5.25c.; zinc, 4c.; pewter, No. 1, 34c.; tin foil, 43.50c.; block tin, 52c.; aluminum, 15c.; all being dealers' prices for less than carload lots.

REINFORCING STEEL

Awards of 4800 Tons, Mostly in Small Jobs, and Inquiries Total 6800 Tons

The week's awards of reinforcing steel totaled about 4800 tons, the largest of which was 900 tons, the remainder being under 500 tons each. New projects up for bids call for a total of about 6800 tons, including one of 1450 tons. Awards follow:

- PHILADELPHIA, 365 tons, Home for Incurables, to Kalman Steel Co.
- PHILADELPHIA, 260 tons, St. Joseph's College, to Concrete Steel Co.
- ALLENTOWN, PA., 490 tons, filtration plant, to Jones & Laughlin Steel Corporation.
- ROCK ISLAND, ILL., 100 tons, dormitory, Augustina College, to Concrete Steel Co.
- MILWAUKEE, 200 tons of rail steel, building for Sears, Roebuck & Co., to Calumet Steel Co.
- HARRISBURG, PA., 100 tons, Pennsylvania State highways in Lehigh and Berks Counties, to Electric Welding Co.
- BUFFALO, 260 tons, school No. 77, to a Buffalo maker.
- DETROIT, 900 tons, factory building for Briggs Mfg. Co., to Truscon Steel Co.
- BATTLE CREEK, MICH., 450 tons, building for Postum Co., to Truscon Steel Co.
- STATE OF WISCONSIN, 500 tons, two highway bridges, to Joseph T. Ryerson & Son.
- CHICAGO, 150 tons of rail steel, Knights of Pythias Temple, to Kalman Steel Co.
- CHICAGO, 450 tons of rail steel, Marie Hotel, to Olney J. Dean & Co.
- CHICAGO, 100 tons of rail steel, apartment building at 4532 Magnolia Avenue, to Calumet Steel Co.
- SPRINGFIELD, ILL., 250 tons of rail steel, State road work, to Kalman Steel Co.

- FRESNO, CAL., 140 tons, Winchell School, to Frederick Steel Co., Alameda, Cal.
- LOS ANGELES, 100 tons, for city work, specification P-778, to California Hardware Co., Los Angeles.

Reinforcing Bars Pending

Inquiries for reinforcing steel bars include the following.

- PHILADELPHIA, 500 tons, building for Philadelphia Wholesale Drug Co.
- PHILADELPHIA, 300 tons, garage at 1515 North Broad Street.
- ROCHESTER, N. Y., 250 tons, subway.
- CINCINNATI, 300 tons, warehouse for Cincinnati Wholesale Grocery Co.
- CHICAGO, 200 tons, addition to power plant for Commonwealth Edison Co.
- CHICAGO, 300 tons, hotel at 835 Sheridan Road; Harry Dalsey, architect.
- CHICAGO, 450 tons, Hartfield apartment hotel, Dearborn and Goethe Streets; R. C. Harris, architect.
- CHICAGO, 480 tons, apartment building at Bryn Mawr and Kenmore Avenues; Complete Artificial Stone Co., general contractor.
- ROCKFORD, ILL., tonnage being estimated, hotel; Hall, Lawrence & Radcliffe, architects.
- SEATTLE, WASH., 100 tons, terminals for Puget Sound Power & Light Co.
- SEATTLE, 300 tons, port elevator.
- OAKLAND, CAL., 100 tons, garage, Fourteenth and Harrison Streets; bids in.
- PASADENA, CAL., 1450 tons, office building at Colorado and Madison Streets.
- LOS ANGELES, 550 tons, garage, Spring Street near Fourth.
- LOS ANGELES, 500 tons, office building, Broadway between Tenth and Eleventh Streets.
- LOS ANGELES, 670 tons, loft building at Pico and Maple Streets.
- LOS ANGELES, 390 tons, architects' building at Fifth and Figueroa Streets.

PERSONAL

William S. Horner, who, as announced in *THE IRON AGE* last week, has resigned the presidency of the National Association of Sheet and Tin Plate Manufacturers, insisted upon



WILLIAM S. HORNER

being relieved of the duties of the office, and his resignation was accepted at a special meeting held in Pittsburgh, April 28. The selection of his successor has been left with the executive committee of the association, which will report at a later meeting. Mr. Horner was born at West Newton, Pa., in 1868. He started as a messenger boy for the Baltimore & Ohio Railroad, and in that capacity picked up telegraphy and by night study learned stenography. Coming to Pittsburgh in 1888 he worked for six years as a stenographer and telegrapher

for H. E. Collins & Co., iron and steel brokers. In 1894, in association with Homer D. Goff, he went into the iron and steel brokerage business on his own account under the firm name of Goff, Horner & Co. When Mr. Goff died in 1914, Mr. Horner bought complete control of the company, which then became W. S. Horner & Co. In 1902 he bought an interest in the Curtis Sheet Steel & Corrugating Co., Zanesville, Ohio, which later became the Muskingum Valley Steel Co., and now constitutes the Zanesville works of the American Rolling Mill Co., Middletown, Ohio. He then became a director of that company and for a number of years was its Pittsburgh district manager. He still is a director and also is a member of the executive committee of the Rolling Mill company, and is also president of the Pittsburgh Shovel Co., of which he is the principal owner.

Upon the formation of what was known as the Association of Sheet and Tin Plate Manufacturers in 1912, Mr. Horner was elected its first president, and when it was succeeded in October, 1916, by the National Association of Sheet and Tin Plate Manufacturers, he continued in that office. The success of this organization constitutes a monument to Mr. Horner, who more than any other individual was responsible for the organization four years ago of the Sheet Steel Trade Extension Committee, of which he has served as chairman and which has done much to extend the use of sheet steel. He is a director of the Exchange National Bank, Pittsburgh, vice-president of the Pittsburgh Y. M. C. A., and a trustee of Allegheny College, Meadville, Pa.

J. George Fuchs, for about 25 years with Bruce & Cook, 190 Water Street, New York, dealers in steel and non-ferrous metals and since liquidation of that firm, a jobber under his own name, has announced his affiliation with Hoffman & Scofield, Inc., 64 Cliff Street, New York, dealer in sheets, tin plate and non-ferrous metals.

James J. Campbell, auditor, assistant secretary and a director of the Carnegie Steel Co., has been elected vice-president and secretary to succeed W. W. Blackburn, who recently retired from business. Mr. Campbell has been with the Carnegie company for more than 40 years, starting with Carnegie Brothers & Co., Ltd., as clerk and stenographer to the purchasing agent Feb. 1, 1886. He since has been successively clerk in the accounting department, chief of the bureau of vouchers, chief clerk of the accounting department, assistant au-

ditor and in January, 1900, became auditor and assistant secretary. Mr. Campbell also is an executive in a number of subsidiary companies of the Steel Corporation. W. W. Blackburn has been connected with the steel business for almost half a century. He was born in Hollidaysburg and came to Pittsburgh in the employ of Wilson & Walker Co., which was taken over by the Carnegie interests in March, 1880. Mr. Blackburn then was bookkeeper. Subsequently he was made chief of the bureau of costs, then assistant treasurer and finally vice-president and secretary. Charles L. Wood, who was made general manager of sales two years ago, has been elected a director to fill the vacancy created by Mr. Blackburn's retirement.

Leonard S. Tyler, vice-president Acme Wire Co., New Haven, Conn., will represent the Manufacturers' Association of Connecticut at the third Pan-American trade conference at Washington.

A. J. Britton, manager Holyoke Foundry Co., Holyoke, Mass., has resigned and is forming a new company to operate a foundry in Springfield, Mass., which has been inactive for some time.

Gerard Swope, president General Electric Co., Schenectady, N. Y., has been made chairman of the International General Electric Co., succeeding the late Anson W. Burchard.

R. I. Willcox, recently resident manager in New York for the Pioneer Coal & Coke Co., is now associated with the Logan Coal Co., Philadelphia, with offices at 52 Vanderbilt Avenue, New York.

Wilson K. Ray, former chief of the hardware section, Iron and Steel Division, Department of Commerce, has been promoted to the position of assistant chief of the division. He was



WILSON K. RAY

formerly connected in Pittsburgh with the Liberty Steel Products Co., and the Lawry-Ray Co., steel broker, having been a member of the latter firm. Mr. Ray was born at Pittsburgh, in 1893, and was educated in the public schools of that city, Shadyside Academy and Princeton University, receiving the A. B. degree from the latter in 1915. From 1915 to 1917 he was engaged in the general insurance business in Pittsburgh and from 1917 to 1919 served with the American Expeditionary Forces in France. Following discharge from the army he returned to

Pittsburgh and was engaged in the sale of iron and steel products and railroad and construction supplies. He was appointed Assistant Trade Commissioner in August, 1923, and assigned to the Paris office. Returning to the United States, he was appointed on Dec. 1, 1925, as special agent in the Industrial Machinery Division of the Department of Commerce and later made chief of the hardware section of the Iron and Steel Division.

Fred E. Holtz, for a number of years representative in Milwaukee for the Jones Foundry & Machine Co., has been appointed to a similar position with the William Ganschow Co., Chicago, and will have his headquarters at 1246 Twenty-fourth Avenue, Milwaukee. He will be assisted in power transmission engineering work by Oscar E. Rosche.

Charles O. Watson, formerly manager of the Buffalo office of Manning, Maxwell & Moore, Inc., New York, has been appointed direct factory representative east of Pittsburgh for the Kempsmith Mfg. Co., Milwaukee.

A. C. Nieman, for some time a member of the Kemp-smith sales organization, has also been appointed a factory representative with headquarters at Cleveland.

J. R. Forcheimer, for 14 years secretary of the Harry Benjamin Equipment Co., St. Louis, has gone into business for himself and will deal in iron and steel waste materials with headquarters at 1257 Syndicate Trust Building, St. Louis. Prior to his association with the Benjamin company he was identified for 14 years with the old Block-Pollak Iron Co., Cincinnati.

Frederick H. Bishop, vice-president Universal Winding Co., Providence, R. I., will speak on "Winding Machines" at a meeting of the American Society for Steel Treating to be held under the auspices of the Rhode Island Chapter of that organization in the rooms of the Providence Engineering Society on the evening of May 12.

Arthur W. Newbould, who has for many years been engaged in the selling of copper products, has become associated with William C. Dickey, 120 Broadway, New York, selling agent in the New York district for the New Haven Copper Co., Seymour, Conn.

W. F. Pravel, formerly connected with the Detroit office of the Denton & Anderson Co., distributor for the Ohio Seamless Tube Co., Shelby, Ohio, and other companies, has been placed in charge of the company's new Southwestern office at 1155 Telephone Building, St. Louis. The Denton & Anderson Co. has been engaged in business as manufacturers' representative for about 20 years.

Daniel M. Rugg, for the last three years sales engineer, Koppers Construction Co., Pittsburgh, has been transferred to the company's Chicago office as Chicago district engineer. Before joining the Koppers organization he was for a number of years superintendent of the Donner-Hanna Coke Corporation, Buffalo. He succeeds Angus McArthur, who goes to New Haven as manager of a coke plant the Koppers Co. is to build there. D. G. Munroe, New York district engineer of the company, has been transferred to Montreal to be manager of a coke plant to be built there jointly by the Koppers Co. and the Montreal Light, Heat & Power Co., Consolidated. His successor is W. H. Earle, formerly general superintendent of gas manufacture, Rochester Gas & Electric Co., Rochester, N. Y.

Jere J. Doherty, for eight years assistant manager of the jobbing department of Follansbee Brothers Co., Pittsburgh, has been transferred to the Indianapolis warehouse of the company, 321 South Missouri Street, as Indianapolis district manager, and has been succeeded at Pittsburgh by T. L. McCombs.

Thomas W. Kennedy, president Mystic Iron Works, Everett, Mass., has been made vice-president in charge of blast furnace operations of the Massachusetts Gas Cos., Boston. He took charge of the construction of the blast furnace in July, 1924. Capt. William E. McKay has been made vice-president in charge of the Everett plants of the gas companies. He is vice-president of the New England Fuel & Transportation Co., and has been associated with the parent company some forty years, having been especially active in the development of the by-product coke plant at Everett. Philip N. Snyder is the new vice-president in charge of coal operations. He is president C. C. B. Smokeless Coal Co., a subsidiary company, and has been active in New River coal fields some forty years. H. S. Lyons was named vice-president in charge of real estate and fleet. He is president Mystic Steamship Co., vice-president New England Fuel & Transportation Co. and a director and secretary of other subsidiaries. G. A. G. Wood is vice-president New England Fuel & Transportation Co., and C. A. Alden assistant treasurer of the Massachusetts Gas Cos.

E. Youlden, representing the Stanley Works, New Britain, Conn., and the Stanley Rule & Level Co., in

Johannesburg, South Africa, was a visitor at the home plant recently.

Harry B. Northrup, chief metallurgist J. W. Kelley Co., Cleveland, gave an informal address and led a discussion on "Carburizing and Quenching" at the meeting of the Indianapolis chapter of the American Society for Steel Treating, April 25.

Clarence M. Wooley, chairman American Radiator Co., New York, has been made a director of the General Electric Co.

F. S. Jones, recently district sales agent at Oklahoma City, Okla., for the Colorado Fuel & Iron Co., Denver, has been appointed assistant manager of sales, steel division, with headquarters at the company's home offices. He has been succeeded at Oklahoma City by E. E. Fisher, formerly sales agent at Pueblo, Colo. Mr. Fisher's place at Pueblo has been filled by D. C. Harmon, who has been serving in a similar capacity in western Colorado, and that territory is now being covered by Granville Lannon, with headquarters at Grand Junction, Colo.

C. Howard Ross, general manager Union Malleable Iron Works, East Moline, Ill., who has been associated for eight years with the Deere & Co. plants, has resigned to enter the University of Michigan medical school.

New Jones & Laughlin Officers

Charles A. Fisher, new president of the Jones & Laughlin Steel Corporation, Pittsburgh, was closely associated with the late William Larimer Jones during 10 of the 29 years he has been with the company. In his financial capacity Mr. Fisher acquired an inside



CHARLES A. FISHER



B. F. JONES

knowledge of the sales side of the business, and, while generally regarded as a financial man, he takes to his new position an intimate knowledge of every phase of the company's activities. He was 22 years old when he went with the company in 1898 as a bookkeeper, and since then he has been successively assistant auditor, assistant treasurer, treasurer, assistant to the president and vice-president in charge of finance. Mr. Fisher is the fourth president the company has had since it was founded 77 years ago and the first outside the family of controlling interest to hold the position.

B. F. Jones, III, recently elected vice-president of the Jones & Laughlin Steel Corporation, has been active in the affairs of the company since he was discharged from the army in 1919 as a second lieutenant. The company was founded by his grandfather, B. F. Jones, and his father, B. F. Jones, Jr., is chairman. The younger Mr. Jones was first assistant treasurer and at the reorganization of the company, effective Jan. 1, 1923, he was elected secretary. He is now vice-president and secretary.

OBITUARY

JOHN Z. SPEER, one of the owners of the Shoenberger Steel Co. prior to its absorption by the American Steel & Wire Co. in 1899, and who constituted one



JOHN Z. SPEER

of the connecting links between the old and modern steel industry, died at his home in Pittsburgh, May 1. He was born in that city Sept. 3, 1840, and as a young man went to work as a warehouse clerk for Shoenberger & Co., Pittsburgh's first iron rolling company, which was founded in 1824. In 1865, when that company decided to build a blast furnace, the firm of Shoenberger, Speer & Co. was organized, Mr. Speer becoming a partner. For many years there were two companies, Shoenberger & Co., operating the rolling mills, and Shoenberger, Speer & Co., the blast furnaces. In the

nineties, the two companies were consolidated as the Shoenberger Steel Co., of which Mr. Speer became vice-president. The American Steel & Wire Co., which became the owner of the company in 1899, operated it until two years ago, when on account of the high land value of its location in the city, it was abandoned and dismantled. Mr. Speer was an active figure in the transition of the industry from iron to steel and among the first to apply chemical and physical analyses for the determination of the quality of raw materials and finished products. He was one of the first of the several groups who initiated the Bessemer process in the United States; he helped develop the methods and blast furnace changes which taught the iron trade the value of Mesaba range ores, and was early in visualizing the value of machinery, his company having been one of the first to bring out machine-made horseshoes. J. Ramsey Speer, one of his sons who was associated with him in the Shoenberger Steel Co., now is president of the Mackintosh-Hemphill Co., Pittsburgh.

JOHN C. OLIVER, formerly president Oliver Iron & Steel Co., Pittsburgh, died at the Union Memorial Hospital, Baltimore, on April 28. He was born at Pittsburgh, Oct. 29, 1863, and was active in the Oliver company from a short time after his graduation from the Sheffield Scientific School of Yale University in 1885 until 1916, when he retired from active business. For the last 11 years of that period he was president of the company, and had continued as a director. He was also a director of the Calumet & Arizona Mining Co. and the National Metal Molding Co.

ALFRED MARSHALL, one of the pioneers in the manufacture of tin plate in the United States, died suddenly at his home at Langhorne, Pa., April 28, aged 79 years. He was a senior member of the tin plate jobbing firm of Marshall Brothers & Co., Philadelphia, but prior to that he was interested not only in tin plate manufacture but in pig iron. He was a son of Caleb Marshall, who was prominently identified with the early history of the steel business in this country. At Kensington, Pa., in 1891, Alfred Marshall began the manufacture of tin plate, his concern being known as the Penn Treaty Iron Works. It was later sold to the American Sheet & Tin Plate Co. Mr. Marshall was also for many years president of the Juniata Furnace & Foundry Co., the blast furnace of that company having been dismantled several years ago. Two of his sons are identified with the iron and steel business. F. Warren Marshall of Philadelphia is a pig iron sales agent for the Delaware River Steel Co., Chester, Pa.,

and Richard M. Marshall is one of the firm of Kerchner & Marshall, Pittsburgh, merchants in pig iron and coke. Richard M. Marshall is also manager of the American Manganese Mfg. Co., and E. E. Marshall, formerly with the latter company, is a nephew of the deceased.

EDGAR RAYSON, sales manager of the fittings department of Stanley G. Flagg, Inc., Philadelphia, manufacturer of malleable castings, died on April 22. He had been affiliated with the Flagg company for 34 years.

RUFUS R. BOLT, finishing mills superintendent for the Donner Steel Co., Buffalo, died last week at the Deaconess Hospital in that city. He had been with the company three years, having come to Buffalo from the United Alloy Steel Corporation, Canton, Ohio.

Pittsburgh Iron and Steel Market

(Concluded from page 1324)

Old Material.—Prices have eased off at least 50c. a ton on all grades in the past week and even more on some. Dealers have become panicky over the continued indifference of consumers, and with the prospect that steel works operations will be materially lower before they move upward again, the pressure to sell is heavy. The market not only lacks consumer support but is getting little from the dealers, who had fairly well reduced their short commitments. It is doubtful if a mill seeking a tonnage of good heavy melting steel could buy it at \$16, but there are no mills in the market and one that was a recent buyer lately has been holding up shipments. That price is all any dealer would pay, and many would not go above \$15.50. Those prices constitute the range on the grade, because the present market is purely a dealers' affair. The market now averages \$1 a ton below the levels of two weeks ago, and unless there is a revival of consumer demand, which is not expected immediately, all that can prevent still lower prices is a refusal of scrap producers to let go. In the price table of a week ago, compressed sheets were quoted at \$15.50 to \$16 and bundled sheet sides and ends at \$14.50 to \$15; these prices were 50c. too high, as \$15.50 was all that could be obtained on the former and \$14.50 was the maximum on the latter grade.

Prices per gross ton delivered consumers' yards in Pittsburgh and points taking the Pittsburgh district freight rate:

Basic Open-Hearth Furnace Grades:

Heavy melting steel.....	\$15.50 to \$16.00
Scrap rails	15.00 to 15.50
Compressed sheet steel.....	14.50 to 15.00
Bundled sheets, sides and ends...	13.50 to 14.00
Cast iron carwheels	15.50 to 16.00
Sheet bar crops, ordinary.....	16.50 to 17.00
Heavy breakable cast	15.00
No. 2 railroad wrought.....	15.50 to 16.00
Heavy steel axle turnings.....	14.00 to 14.50
Machine shop turnings	12.00 to 12.25

Acid Open-Hearth Furnace Grades:

Railroad knuckles and couplers..	18.00 to 18.50
Railroad coil and leaf springs...	18.00 to 18.50
Rolled steel wheels	18.00 to 18.50
Low phosphorus billet and bloom ends	20.00 to 20.50
Low phosphorus, mill plate.....	19.50 to 20.00
Low phosphorus, light grade.....	17.00 to 17.50
Low phosphorus sheet bar crops...	19.00 to 19.50
Heavy steel axle turnings.....	14.00 to 14.50

Electric Furnace Grades:

Low phosphorus punchings.....	18.50 to 19.00
Heavy steel axle turnings.....	14.00 to 14.50

Blast Furnace Grades:

Short shoveling steel turnings...	11.50 to 12.00
Short mixed borings and turnings	11.50 to 12.00
Cast iron borings	11.50 to 12.00
No. 2 busheling	11.00 to 11.50

Rolling Mill Grades:

Steel car axles	20.50 to 21.00
No. 1 railroad wrought	12.50 to 13.00

Cupola Grades:

No. 1 cast	16.00 to 16.50
Rails 3 ft. and under	18.00 to 18.50

Malleable Grades:

Railroad	15.50 to 16.00
Industrial	15.00 to 15.50
Agricultural	14.50 to 15.00

Record Steel Output in Germany

Domestic Demand Large—Continental and British Shipyards Busy—Poland
'Increases Exports to Justify High Steel Cartel Quota

(By Cable)

LONDON, ENGLAND, May 2.

Pig iron continues quiet, but Cleveland producers are adhering to quotations, although makers in other districts are inclined to grant small concessions. Consumers are purchasing only for immediate requirements and Continental imports are increasing. Hematite is easy as the price is uncontrolled and demand is improving, especially for export.

Ferromanganese for domestic consumers has been reduced 20s. per ton (\$4.85) and the export price is also easier, but quotations are nominal, varying according to local conditions. Foreign ore continues quiet.

Finished steel demand is improving, mainly in the domestic market, as a result of further orders for new vessels, which include a 10,000-ton P. & O. liner placed with Alexander Stephen & Sons, Ltd., Glasgow. The Clyde output is increasing, with an April total of 21 vessels of 33,000 tons.

Tin plate is weak and business is poor, makers using foreign steel quoting as low as 19s. 3d. (\$4.66) per base box, f.o.b. Mills employing Welsh sheet bars ask 20s. (\$4.85) and higher per base box. Improvement in the situation is considered impossible until Welsh steel, which is still higher than the pre-coal strike rate, is cheaper.

India has bought good tonnages of galvanized sheets, prices ranging down to £14 10s. (3.13c. per lb.) per ton, f.o.b., for No. 24 gage corrugated sheets in bundles. The market is now firmer at £14 15s. (3.19c. per lb.) per ton and upward. Black sheets are quiet and prices unchanged.

Continental markets are irregular and although demand is improving, as a result of the low level of values, business is insufficient to check the decline of prices. The International Steel Cartel meeting will be held in Luxemburg, Tuesday, May 3. The result of this meeting is awaited with interest as it is expected to indicate the course of future developments.

German Iron and Steel Output Grows With Large Home Demand

(By Radio)

BERLIN, GERMANY, May 2.

The total production of rolling mill products in March was 1,100,728 metric tons, which is the largest output in any month since the war. March pig iron production was 1,085,850 metric tons and steel ingot output was 1,415,083 tons.

Prices of the Pig Iron and of the Steel syndicates are continued unchanged for May, and no revision of export bounties to exporting manufacturers has been made by the Steel syndicate.

Export trade is dull, and producers are ignoring foreign markets for a domestic field which is growing more active as a result of marked improvement in building construction and shipbuilding.

Steel mills have sufficient tonnage to carry them

through to the end of June, and some are refusing to book new orders. There is an increased demand for pig iron from foundries, and the semi-finished steel market is strong.

Sheet and wire mills are unable to obtain prompt delivery of raw materials. The market on steel bars and bands is firm.

Large Percentage of Difference In European Home and Export Prices

HAMBURG, GERMANY, April 12.—In almost all European steel-producing countries there is a considerable difference between the domestic market and the export price of pig iron and steel products. A comparison of domestic and export prices in March shows that pig iron was exported from various countries at prices 4 to 45 per cent lower than the domestic price, semi-finished products 4 to 40 per cent lower and finished material

British and Continental European prices per gross ton, except where otherwise stated, f.o.b. makers' works, with American equivalent figured at \$4.85 per £ as follows:

Durham coke, del'd.	£1 2½s.	to £1 3s.	\$5.46 to \$5.58
Bilbao Rubio ore f.	1 2	to 1 2½	5.33 to 5.45
Cleveland No. 1 fdy.	4 2½		20.00*
Cleveland No. 3 fdy.	4 0		19.40*
Cleveland No. 4 fdy.	3 19		19.15*
Cleveland No. 4 forge	3 18½		19.03*
Cleveland basic	3 15	to 3 15½	18.18 to 18.30
East Coast mixed	4 2		19.88
East Coast hematite	4 2½		20.00
Rails, 60 lb. and up.	7 15	to 8 5	37.58 to 40.01
Billets	7 5	to 7 10	35.16 to 36.37
Ferromanganese	14 0		67.90
Ferromanganese (export)	13 10	to 14 0	65.47 to 67.90
Sheet and tin plate bars, Welsh	6 5	to 6 10	30.31 to 31.52
Tin plate, base box	0 19¼	to 0 19½	4.66 to 4.72
Black sheets, Japanese specifications	14 5		69.11
Ship plates	7 15	to 8 5	1.68 to 1.78
Boiler plates	11 0	to 11 10	2.38 to 2.49
Tees	8 10	to 9 0	1.84 to 1.95
Channels	7 15	to 8 5	1.68 to 1.78
Beams	7 10	to 8 0	1.62 to 1.73
Round bars, ¾ to 3 in.	8 5	to 8 15	1.78 to 1.89
Steel hoops	10 10	to 11 0	2.28 to 2.39
Black sheets, 24 gage	11 5		2.44
Galv. sheets, 24 gage	14 15		3.19
Cold rolled steel strip, 20 gage, nom.	14 0		3.03

*Export price, 6d. (12c.) per ton higher.
†Ex-ship, Tees, nominal.

Continental Prices, All F.O.B. Channel Ports (Per Metric Ton)

Foundry pig iron: (a)			
Belgium	£3 5s.		\$15.76
France	3 5		15.76
Luxemburg	3 5		15.76
Basic pig iron:			
Belgium	3 3		15.28
France	3 3		15.28
Luxemburg	3 3		15.28
Coke	0 18		4.37
Billets:			
Belgium	4 8		21.33
France	4 8		21.33
Merchant bars:			
Belgium	4 13		1.01
Luxemburg	4 13		1.01
France	4 13		1.01
Joists (beams):			
Belgium	4 14		1.02
Luxemburg	4 14		1.02
France	4 14		1.02
Angles:			
Belgium	4 14		1.02
¼-in. plates:			
Belgium (nominal)	6 7		1.38
Germany (nominal)	6 7		1.38
¾-in. ship plates:			
Belgium	5 18		1.29
Luxemburg	5 18		1.29
Sheets heavy:			
Belgium	6 3	to £6 4s.	1.35 to 1.36
Germany	6 3	to 6 4	1.35 to 1.36

(a) Nominal.

3 to 40 per cent lower. The following comparison of prices for March, 1927, shows the percentage of difference between the export and domestic prices in eight continental countries, Great Britain and the Saar district.

Country of Origin	Pig Iron	Semi-Finished	Finished Products
Great Britain	5.0	4.0	7.5
Belgium-Luxemburg ..	10.0	10.0	9.0
France-Saar	12.0	12.0	11.0
Germany	18.0	15.0	26.0
Austria	21.0	27.0	24.0
Czechoslovakia	22.0	29.0	31.0
Poland	45.0	40.0	40.0
Sweden	4.0	0.0	3.0

This comparison is based on an average of pig iron, semi-finished and finished steel prices in the domestic market of each country and compared with that country's export selling prices. The wide difference between the export and domestic prices in Poland is attributable to the effort being made by Polish mills to increase their export business sufficiently to justify the high quota which they have demanded as the basis for their adherence to the International Steel Cartel.

FRENCH TRADE BETTER

But Export Business Quiet—British Pig Iron Competition—Automobile and Shipbuilders Busy

PARIS, FRANCE, April 22.—The domestic market is showing a slight improvement, but export business is still quiet. The depressed situation in export trade is usually attributed to overproduction of metal products, not only in France, but in Germany and Britain. In addition, resumption of operations by the British has caused a considerable decrease in the volume of business placed on the Continent. A further factor in curtailment of export business is the reduced purchasing of China, normally a fairly large market.

Since the middle of March the domestic market has begun to revive, evidently from the fact that buyers have withheld business as long as possible and are now being forced to purchase for immediate requirements. Especially in the shipbuilding industry is this increased activity notable. The automotive industry is also becoming a more important buyer of steel and the general spring demand has added to the increased volume of buying although new construction and other seasonal work is smaller than usual.

The next meeting of the International Steel Cartel is scheduled for May 3, and it is generally expected that progress will be made toward the establishment of subsidiary cartels or syndicates. The question of Polish participation in the cartel will also be considered.

Pig Iron.—Export business is becoming more difficult to transact as British furnaces are returning to foreign markets with increased production. In the domestic field demand is becoming slightly more regular for foundry iron, but is still far from being as large as in the second half of last year. The entente of French, Belgian and Luxemburg producers has decided on 650 to 660 fr. per metric ton for No. 3 foundry, the price depending upon the size of the purchase. Export transactions are being made at £3 8s. to £3 9s. (\$16.50 to \$16.75) per ton, f.o.b. Antwerp. Buying of hematite is on a larger scale and producers have established 30,000 tons as the quota for the domestic market in May and 10,000 tons as the tentative quota for June delivery. Prices are being maintained, but on desirable business concessions of 10 fr. to 15 fr. per ton are reported. British competition for hematite business is again becoming a factor, which accounts in part for the tendency to offer concessions. Coke is reported to have been sold at 16 to 16.50 m. (\$3.78 to \$3.90) per ton by operations, which did not adopt the price of 17.50 to 18 m. (\$4.13 to \$4.25) per ton, established by the German Kohlensyndikat. French metallurgists have entered into discussions with the Kohlensyndikat, offering these lower prices for syndicate coke on contracts covering 1927 and part of 1928, but no reduction in the syndicate price is reported to have been made. M. Tardieu, minister of public works, in a recent speech before the Chamber of Deputies, empha-

sized the necessity of developing in France a coke production that would make the country independent of foreign producers. Efforts have been made by the French collieries to increase the coal output and in February production was 312,525 tons.

Semi-Finished Material.—Export demand is light and prices are soft. Nominally, billets are £4 7s. to £4 10s. per ton (\$21.09 to \$21.82) and blooms £4 2s. to £4 5s. 6d. (\$19.88 to \$20.73) per ton, f.o.b. Antwerp. The domestic market on billets and blooms is also quiet and on sizable tonnages considerable reductions have occasionally been made.

Finished Material.—Sellers are showing more resistance to the demand of buyers for lower prices, but business is light and mills are only moderately well booked. The average length of contracts on mill books is longer than recently, but many mills are still in need of more tonnage. Spring demand for building construction has provided some business, but it is smaller than usual. However, the Bank of France has lowered its discount rate and with cheaper money, more construction work may develop. Steel bars are quoted at £4 15s. to £4 16s. (1.04c. to 1.06c. per lb.), with as low as £4 14s. per ton (1.03c. per lb.) reported done on desirable business. Beams range from £4 14s. to £4 14s. 6d. per ton (1.03c. to 1.04c. per lb.) Wire rod contracts have been made at £5 2s. 6d. (1.13c. per lb.), although the price is supposed to be £5 5s. per ton (1.15c. per lb.), f.o.b. Antwerp.

POLISH PRICES STRONG

Mills Seek Advances But Are Opposed by Government—Developing Export Business

WARSAW, POLAND, April 18.—The Polish Steel Syndicate, which, since the East Upper-Silesian producers have joined, includes all Polish mills, decided last month to increase the domestic prices of steel by about 11 per cent. This advance was to be effective April 1. The Ministry of Trade and Industry, however, has protested, and threatens that, should this price increase be maintained, railroad freight rates will be revised, import duties reduced and present tax exemptions on steel exports withdrawn. Prices of steel products, prior to the advance, were in zlotys per metric ton:

Billets	315	\$37.80
Slabs	330	39.60
Bars	360	43.20
Universal iron	400	48.00
Wire rods	410	49.20
Heavy sheets	445	53.40

Domestic and export business have improved recently, as mills are making strong efforts to increase production in order to justify their demands for a large quota in the International Steel Syndicate. The March output of the Konigs und Laura Heutte in East Silesia was 40 per cent in excess of the total output of all East Silesian works at the end of 1925. The total ingot production in Poland in February was 94,222 metric tons, of which 60,676 tons was in East Upper Silesia and 33,368 tons in the Dombrowa district. The February pig iron output was 42,703 tons, of which 31,166 tons came from East Upper Silesia. The increase of production has developed a heavy demand for scrap. Imports of scrap this year have averaged 30,000 tons a month, compared with an average of 13,500 tons a month in 1926.

The question of adherence of Polish works to the International Steel Cartel will be discussed again at the next meeting of the International Steel Cartel in May. All the Silesian works are reported to favor joining the cartel, but the quota question is still an obstacle. The possible suggestion of the cartel that the Polish domestic market will be guaranteed to Polish mills will probably be rejected, as Polish producers are seeking a sizable export quota. Consequently, export business is being sought regardless of profit in many instances. In the first half of 1926 the average monthly exports of rolled products was only 610 tons. In the third quarter this average had risen to more than 2000 tons a month and in November and December of last year exports were 4414 tons and 4868 tons respectively. These figures do not include sheets, but exports of sheets also registered large increases in the latter half of the year.

Research Active in Welding Field

(Continued from page 1290)

struction of transformer cores was illustrated and described by Mr. Tobey. The former practice was to produce these punchings in standard punch presses from mill length sheets entirely by hand feed. The speed was necessarily limited and there was a serious loss in material at each end of the sheet, particularly with L-shaped punchings. These sheets, fed into the press individually, ranged from 110 to 120 in.

To overcome the limitations in speed of production and reduce waste of material, an automatic feed was designed for the press and a resistance line welding machine for joining the strips together in one long continuous ribbon. The welding speed is approximately 240 in. per min. with a current of 3000 to 4000 amp.

It was said that as a result of these applications and other changes accompanying them the amount of scrap has been reduced from about 35 per cent to 10 per cent. A number of these machines are in operation at the company's Pittsfield, Fort Wayne and Canadian plants.

Transformer tanks, formerly cast, are now made of sheet steel joined by resistance welding, two distinct types of machine having been developed for the welding of these tanks, which range in size from 16 to 21 in. in diameter and 20 to 50 in. in height. The steel ranges from 3/32 to 1/2 in. in thickness. One unit, a straight line welder, is used for longitudinal casing seams and for welding the corrugations to the casings. The other machine, a circular line welder, is used for welding the bases and rims to the casings and for welding the ends of the corrugations. Welding is done under water, in order to keep the electrodes and work cool and obviate tendency to warping. The currents on these machines range from 10,000 to 14,000 amp. and the speed of welding ranges from approximately 20 in. to 40 in. per min., depending upon the nature of the work.

Advocates Welding of Structural Members

"Replacing Castings by Welded Steel Parts" was the title of a paper by J. F. Lincoln, vice-president of the Lincoln Electric Co., Cleveland, who spoke briefly, emphasizing one or two of the principal points brought out in his paper, which was preprinted.

It is possible to replace castings with welded structural steel, said Mr. Lincoln, because of these facts: "The tensile strength of cast iron is approximately 10,000 lb. per sq. in., that of welded steel approximately 50,000 lb. The modulus of elasticity of cast iron is 12,000,000, that of steel, 30,000,000. The average cost of castings is 6c. per lb., that of steel, 2c. per lb.

"The factor of safety necessary for the same degree of safety will be half as great with steel as with cast iron. Therefore, if a pressure vessel of any kind is to be made in which the strength of the shell is the limiting factor, if made from cast iron it will cost, for the same degree of safety, approximately 25 times as much as if made from rolled steel. If a base or any structure which is used for resisting bending is to be made, the cost will be approximately 15 per cent as much if made from structural steel as if made from castings."

It is pointed out in the formal paper that the matter of replacing castings with welded structural shapes was not merely a matter of replacing one material with another. "The proposition is not nearly as simple as that," said Mr. Lincoln. "A casting can be made into any shape with ease; rolled steel is of necessity, from its very method of manufacture, made in certain shapes and those only. . . . There are a great many cases where it is necessary to make a structure which is radically different from the shapes to be had from the mills, and therefore the possibilities of the designing engineer in redesigning cast structures to the use of welded steel is of enormous importance." It was stated that the importance of this was regarded as so great by the Lincoln company that the company is offering \$17,500 in prizes for the best application of arc welding to the redesign of present day structures.

Examples of the use of arc welded steel in place of castings and comparisons of cost are given in Mr. Lincoln's paper. These include a rotor spider and other

parts for an electric motor, and in the discussion following his address Mr. Lincoln suggested redesign of the engine lathe, which he said could be built better and cheaper, and wearing parts much more easily replaced if of welded steel.

In further discussing the application of welding Mr. Lincoln stated that "much work must still be done in getting the best shapes and the best methods of applying these shapes to the work in hand. In the case of buildings, there is still much work to be done in the design of the joint for most efficient application of the new process, also for the methods of erection."

Reference was made to the application of welding in the manufacture of pipe. "The advantage here," he said, "is that the diameter and thickness of wall can be made anything that is required; the material going into the pipe can have a wide range of specification and still the cost probably would not be more than two-thirds of the tube mill or riveted pipe. Because of this, pipe lines in the future undoubtedly will be welded, in the making of each section itself, as well as welding the sections together in the field."

In the discussion following Mr. Lincoln's brief address one speaker commended the Lincoln company on its arc welding prize contest, saying that "it will mean more in the education of the engineering fraternity to the use of welding than anything we have yet done."

Arc Welding Applied to Roofs and Other Parts of Buildings

Arc welded structural work that has been accepted by civic and state authorities, and which is in actual service, was dealt with in a paper by C. J. Holslag, manager of the Electric Arc Cutting & Welding Co., Newark, N. J. The title of Mr. Holslag's paper was "Application of Arc Welding to Houses and Buildings."

The completely welded house built at Teaneck, N. J., by J. J. Dudley of the Weldcrete Co., and the Electric Arc Cutting & Welding Co., was illustrated and described at length. This house is similar in design to the usual wood-frame type, but is of steel. It was built from flat and standard sections which were lifted into place and the sections welded together. All cutting was done by means of the electric arc.

Another use of arc welding was in attaching roof purlins to rafters in buildings having a fireproof slab roof. The standard T-bars, formerly drilled, bolted or tapped in place by hand on the roof, are replaced by the cutting and fitting of the pieces and tacking them in place by arc welding.

Some 15 buildings of various types, in and around New York, on which welding was employed, were listed. Other uses of welding in building construction, such as the piecing out and joining of members to fit special needs, ornamental and special iron work, etc., were mentioned, as well as the use of arc welding in building alteration. As an example of the latter use, the boiler framing, etc., done by the Foundation Co. recently on the interior of a bank building at Newark, N. J., was cited. Arc cutting and welding was said to have been used extensively on the work, the cutting to remove parts of the structure and the welding to fit and replace the parts.

Among the advantages claimed for the use of arc welding in structural work were lower cost and rigidity and strength. A single welding machine and its operator, it was pointed out, forms a complete producing unit which can work independently. The tightness of a welded joint was also stressed, and a marked advantage of the welded construction was said to be in its adaptability for making, on the spot, structural shapes to meet any particular need. "For this reason," said Mr. Holslag, "builders find the arc process capable of extensive service in a variety of applications, such as metal window framing, corner angle work, metal stairways, newel posts and hand rails, doors and door framing stiffening members, chutes, hoppers, balconies, etc."

Application of oxy-acetylene welding in the manufacture of bedroom chairs, dressers, tables and other

furniture at the plant of the Simmons Co., Kenosha, Wis., was described by M. F. Bayer of that company. Spot and butt welding are also employed.

The furniture is made from steel ranging in thickness from 0.040 to 0.060 in. The frame is made up of tubes and channels. Jigs and other work holding frames are extensively used, and special automatic machines, themselves made of welded steel members, have been developed by the company. In the beginning, one of the problems in welding was the residue left from the flux, but non-fluxing welding rods are now used, these being said to be responsible for the success in welding the steel furniture. Some of the operations in the manufacture of chairs, bedroom dressers and chiffo-ropes were pictured by slides and briefly explained.

The welding of the aluminum sheets used for the manufacture of bodies for Pierce-Arrow automobiles was briefly outlined by F. E. Klein of the Pierce-Arrow Mfg. Co. Welding is by means of the oxy-acetylene process. It was pointed out that success in the welding of aluminum depends a great deal upon the flux used. Oxide is removed by live steam cleaning. Each weld is hammered and every inch of the body surface is hand filed and hand polished.

In the discussion of this paper one speaker said that in welding aluminum his company had found that it is very desirable to remove the flux, especially when the aluminum is to be painted. This is done by dipping the piece into hot water and then into a 2 per cent solution of nitric acid, washing with hot water again to remove the acid. In discussing the resistance welding of aluminum another speaker said that the principal objection was that the aluminum alloys with the electrode. Elkonite has been found to work more satisfactorily, it was said, and an investigation is being made to determine the feasibility of using water-cooled electrode holders, etc.

Officers of Welding Society Re-elected

F. M. Farmer, chief engineer, Electrical Testing Laboratories, New York, was re-elected president, and J. H. Edwards, assistant chief engineer of the American Bridge Co., New York, was elected senior vice-president of the American Welding Society.

G. O. Wilson, engineer of the Standard Oil Co. of California, San Francisco, was re-elected divisional vice-president, Pacific division; and R. L. Shepherd, Southern editor of the *Electrical World*, Birmingham, was elected divisional vice-president, Southern division. A. M. Candy, engineer, Westinghouse Electric & Mfg. Co., East Pittsburgh; R. L. Browne, district sales manager of the Metal & Thermit Corporation, New York; and Stuart Plumley, Acetylene Journal Publishing Co., Chicago, continue as vice-presidents. C. A. McCune, American Chain Co., Bridgeport, Conn., continues as treasurer, and Miss M. M. Kelly as secretary and assistant treasurer. W. Spraragen is technical secretary.

President Farmer, in his address opening the sessions of the welding society, gave the total membership of the society, as of March 31, as 854. A new section, with a membership of 28, has been established in Canada. It was announced that the exposition of welding equipment was to be a permanent feature of the fall meetings of the society. Preparation of training courses for welders has been completed by the educational committee and these courses will be in print within the next few weeks.

American Company to Build Japanese Electric Plant

The H. K. Ferguson Co., engineer and builder, 4900 Euclid Avenue, Cleveland, has been awarded a contract for the design and construction of the first unit of a lamp factory for the Tokyo Electric Co. at Kawasaki, Japan, a subsidiary of the Lamp Works Division, General Electric Co.

The new unit is to replace a part of the original factory which was demolished completely in the earthquake of September, 1923. It is to be 180 ft. wide by 400 ft. long, three stories. Due to the unusual nature of the ground conditions, coupled with the probability

of earthquakes, a special foundation will be employed consisting of a reinforced concrete mat under the entire building. The structural frame has been designed as a rigid frame calculated to withstand an earthquake of the same intensity as the one of 1923 at the same location.

W. N. Thompson sailed April 26 from Seattle, taking with him complete plans and specifications ready to begin construction. The construction force is now in Japan under the general direction of T. H. Mitchell, who will immediately start work on this new unit.

JAPANESE TRADE QUIET

No Improvement Is Expected Until Expiration of Moratorium—Some Inquiry for Rails

NEW YORK, May 3.—Export trade continues quiet, with Far Eastern business confined to small lot purchasing of the kind that normally appears from South and Central American markets and Cuba. With a three weeks' moratorium effective in Japan on April 25, but little new business is developing from this market, but with the moratorium ended and the financial situation improved, a fair volume of buying is expected in some quarters.

Current inquiries from Japan are small, with the exception of occasional purchases by Government departments and municipalities. The Japanese Navy is in the market for 6500 base boxes of oil can tin plate, bids on which will be opened early this month. Osaka municipality is inquiring for a small tonnage of grooved and girder rails, and the South Manchuria Railway Co. is taking bids on 20,000 splice bars (about 345 tons) for 80-lb. and 100-lb. rails. The 600 tons of tie plates for the Chosen State Railways went to a large Japanese export house in New York and were placed with the leading interest. The recent inquiry of the Nagoya Gas Co. for close to 1,000,000 ft. of gas pipe has been temporarily withdrawn.

Prices on European Products

Importers of European steel products for the American market are quoting lower prices than at any time in the past year and a half or more. The current level is about 1.70c. per lb. base on plain steel bars, about 1.75c. per lb. on corrugated bars and about 1.60c. to 1.65c. per lb. on structural material. While the interest of consumers in foreign steel is apparently increasing slightly, tonnages involved are still small and business, in many instances, is secured by offering terms instead of basing it on a letter of credit or cash against shipping documents.

Where Scrap Was Exported Last Year

Scrap exports from the United States in 1926 aggregated 104,738 gross tons, according to revised figures prepared by the Department of Commerce. Canada was the principal consumer, taking more than five-eighths of the total outgoing tonnage. The aggregate was distributed as follows:

	Tons		Tons
Canada	66,212	Japan	18,868
Mexico	819	China	3,824
Cuba	28	Hongkong	194
Panama	20	Philippine Islands...	73
British Honduras...	6	Kwangtung	25
Chile	1	Egypt	12
		India	1
Total America.....	67,086	Total Asia and Africa	22,997
Italy	12,147		
Great Britain.....	2,120		
Germany	385		
Sweden	3		
Total Europe.....	14,655		

The annual conference of the Verein Deutscher Chemiker (Association of German Chemists) and also the fifth Exhibition of Chemical Apparatus will be held at Essen, Germany, June 7 to 19. The association of chemists consists of four-fifths of the chemists in Germany, representing about 10,000 in number, many of them in the steel and metallurgical industries.

Large Machinery Exports in March

Greatest Monthly Total in Several Years—Gain Over
February More Than \$9,000,000—Imports
Continue in Heavy Volume

WASHINGTON, April 30.—Making a gain of \$9,340,761, or a little more than 32 per cent, exports of all machinery from the United States in March were valued at \$38,915,857, against \$29,575,096 in February. In March of last year they were valued at \$35,225,567. The current figure represents the largest monthly total in several years. For the three months ended March 31 the value was \$101,916,818, a slight drop under the corresponding period of last year, when the value was \$102,082,021.

Exports of power-driven metal-working machinery, as listed in THE IRON AGE table, represented 905 machines, valued at \$754,503, as against 537 valued at \$745,646 in February. Exports of all power-driven metal-working machinery in March were valued at \$1,326,260, against \$1,297,616 a year ago. For the three months ended March, 1927, they were valued at \$3,941,643, compared with \$3,480,172 for the corresponding period of 1926.

Industrial machinery, as classified by the Division of Statistics, Department of Commerce, was exported to the value of \$17,728,393 in March, 1927, against \$14,584,670 in March of last year. For the three months ended March 31 this division gives the value of these exports as \$49,037,423, while for the corresponding period of last year the value is given as

\$42,978,999. The Industrial Machinery Division, under its more limited classification, gives the value of exports of industrial machinery in March of the present year as \$14,036,000, against \$12,275,000 in February of the present year and \$12,857,000 in March, 1926.

Imports of all machinery in March were valued at \$2,668,715 as against \$2,471,307 in March of last year. For the three months ended March, 1927, the value was \$6,981,251, against \$6,596,946 for the corresponding period of last year. Imports as listed in THE IRON AGE table were valued at \$1,540,356 in March, compared with \$1,483,713 in February. For the three months ended March, 1927, machinery imports carried in THE IRON AGE table were valued at \$5,208,328, while for the corresponding period of last year the value was \$4,953,340. The heaviest gain made in imports in March, 1927, over March, 1926, was in electrical machinery and apparatus.

Industrial Machinery Division charts show that the export trade in industrial machinery for the first quarter of 1927 has been maintained at a much higher level than during the corresponding period of last year. The average of monthly exports for the 1927 period amounted to \$13,752,798, according to this division, as compared with \$12,339,411 for the corresponding period of 1926 and an average of \$13,061,005 for the entire

Exports of Power-Driven Metal-Working Machinery

	March, 1927		February, 1927	
	No.	Value	No.	Value
Engine lathes	44	\$65,332	53	\$87,896
Turret lathes	15	50,150	21	61,178
Other lathes	35	35,308	56	98,368
Vertical boring mills and chucking machines	5	12,622	16	31,141
Thread-cutting and automatic screw machines	63	68,007	56	80,891
Knee and column-type milling machines	11	32,537	30	52,459
Other milling machines	27	81,457	21	23,979
Gear-cutting machines	62	52,738	7	13,518
Vertical drilling machines	56	12,738	35	25,520
Radial drilling machines	18	19,625	3	7,377
Sensitive drilling machines	58	8,880	40	7,394
Other drilling machines	266	9,702	49	20,630
Shapers and slotters	49	69,057	10	10,783
Planers	2	7,500	7	32,448
External cylindrical grinding machines	49	119,363	38	82,019
Internal grinding machines	25	81,241	29	59,248
Metal-working tool-sharpening machines	120	28,246	66	50,797
Total	905	\$754,503	537	\$745,646

Imports of Machinery Into the United States

	March		Three Months Ended March 31	
	1927	1926	1927	1926
Metal-working machine tools	\$79,104	\$38,610	\$144,417	\$126,730
Agricultural machinery and implements	958,348	560,305	1,829,475	1,285,303
Electrical machinery and apparatus	303,706	198,300	698,097	506,067
Other power-generating machinery	546	1,424	19,935	2,534
Other machinery	734,778	2,019,092	2,491,822	
Automobiles and other vehicles, except agricultural	198,652	180,817	497,312	540,884
Total	\$1,540,356	\$1,714,234	\$5,208,328	\$4,953,340

Machinery Exports from the United States

	(By Value)		Three Months Ended	
	March, 1927	March, 1926	March, 1927	March, 1926
Locomotives	\$2,256,119	\$233,248	\$3,452,072	\$1,960,958
Other Steam Engines	75,921	39,679	414,343	241,295
Boilers	117,234	154,367	538,889	452,373
Accessories and Parts	123,080	123,329	516,311	368,362
Automobile Engines	1,359,430	1,969,337	3,142,468	4,139,009
Other Internal Combustion Engines	1,013,074	538,306	2,894,154	3,928,498
Accessories and Parts	418,355	443,663	1,115,848	990,832
Electric Locomotives	58,396	349,108	129,799	912,441
Other Electric Machinery and Apparatus	829,310	650,007	2,183,160	1,715,540
Excavating Machinery	449,249	315,189	1,080,218	969,176
Concrete Mixers	114,144	72,479	308,821	198,632
Road-Making Machinery	179,317	178,877	369,812	454,583
Elevators and Elevator Machinery	443,901	418,760	1,303,962	1,263,618
Mining and Quarrying Machinery	1,189,923	1,453,987	3,266,462	2,927,790
Oil-Well Machinery	1,279,609	1,279,304	4,692,271	4,129,987
Pumps	469,907	565,665	1,505,759	1,648,614
Lathes	180,790	106,435	572,879	460,604
Boring and Drilling Machines	93,567	75,385	230,914	161,004
Planers, Shapers and Slotters	76,557	35,475	172,428	74,710
Bending and Power Presses	102,341	104,180	268,306	188,963
Gear Cutters	52,738	88,525	100,583	141,061
Milling Machines	113,994	79,911	299,132	219,606
Thread-Cutting and Screw Machines	68,007	75,007	227,108	174,887
Forging Machinery	68,291	88,351	224,596	256,641
Sharpening and Grinding Machines	200,604	201,753	533,467	402,791
Other Metal-Working Machinery and Parts	420,523	339,369	1,057,583	1,108,669
Textile Machinery	816,400	867,284	2,562,843	2,947,022
Sewing Machines	824,205	682,881	2,332,392	1,963,630
Shoe Machinery	147,636	98,923	321,271	308,974
Flour-Mill and Gristmill Machinery	36,825	105,731	98,996	226,622
Sugar-mill Machinery	178,755	243,145	638,412	665,083
Paper and Pulp-Mill Machinery	298,462	240,469	1,457,828	871,441
Sawmill Machinery	46,736	116,744	184,990	272,867
Other Woodworking Machinery	137,245	96,893	330,815	319,801
Refrigerating and Ice Making Machinery	578,830	283,491	1,619,723	957,216
Air Compressors	482,737	466,231	1,207,032	1,119,349
Typewriters	1,868,453	1,999,559	5,108,934	5,298,341
Power Laundry Machinery	199,842	119,751	427,453	332,625
Typesetting Machines	1,868,453	243,421	5,108,934	5,298,341
Printing Presses	1,274,189	719,832	3,458,307	4,425,922
Agricultural Machinery and Implements	8,743,621	7,939,597	18,861,635	25,086,825
All Other Machinery and Parts	9,789,495	10,926,987	27,680,608	22,727,117
Total	\$38,915,857	\$35,225,567	\$101,916,818	\$102,082,021

year 1926. A comparative table presented by this division shows March gains of approximately \$1,000,000 each in exports under the heads of "construction and conveying machinery" and "metal-working machinery."

Comparison for the three months shows that exports of construction and conveying machinery have decreased slightly, whereas exports of metal-working machinery have increased more than \$400,000. The most consistent increases during 1927 have taken place in miscellaneous unclassified industrial machinery. Exports under this head in March were valued at \$5,669,282, compared with \$4,325,578 a year earlier, and during the three months ended March these shipments totaled \$15,822,261, against \$11,556,118 last year, a gain of more than \$4,266,000.

Exports of both mining and textile machinery have been on the decline during 1927. March shipments of mining and quarrying machinery decreased from \$1,453,987 last year to \$1,180,823, and for the three months from \$3,927,780 to \$3,386,462. Although textile machinery exports decreased only moderately during March, the decline for the three months was from \$2,947,022 to \$2,562,842, a loss in excess of \$384,000.

Comparison of exports of individual types of industrial machinery discloses striking fluctuations. Exports of dredges, road rollers, cranes with swinging booms and hoists and derricks have decreased sharply, both during March and in the first quarter of 1927.

Exports of dredges decreased from \$149,110 for March, 1926, to \$28,489. Exports for the corresponding quarters were \$272,630 and \$94,144, respectively. Shipments of road rollers declined from \$64,026 to \$23,711 for the respective months and from \$160,065 to \$61,421 for the corresponding quarterly periods. Similarly, shipments of cranes with swinging booms decreased from \$82,755 in March, 1926, to \$3,461, and from \$278,802 to \$80,892 for the respective quarters. Exports of hoists and derricks, except mining, fell from \$112,744 to \$65,470 for the corresponding months and from \$354,810 to \$241,068 for the three-month periods.

Substantial increases, however, were experienced in exports of concrete mixers, miscellaneous cranes, and elevators, both for the month and for the quarter, as shown in the accompanying table.

Locomotives to the number of 47, valued at \$2,256,-

119, were exported in March, of which 41, valued at \$2,164,298, went to Brazil. Sewing machines for industrial use were exported to the value of \$305,630 in

United States Exports and Imports of Machinery

	Exports of Machinery	Imports of Machinery	Exports of Power-Driven Metal-Working Machinery
The year 1924...	\$317,040,424	\$9,711,618	\$8,644,444
1925			
January	28,117,952	803,829	845,986
February	23,215,776	814,703	707,445
March	33,932,473	999,237	1,364,950
April	33,468,086	1,167,099	1,594,761
May	32,164,865	861,655	1,230,914
June	27,121,123	935,487	1,003,325
Fiscal year	325,578,294	10,404,337	14,011,404
July	32,320,533	905,872	1,188,069
August	38,768,823	747,912	1,308,272
September	30,719,342	956,250	989,279
October	31,271,007	996,557	905,828
November	30,084,814	876,113	1,007,276
December	37,933,511	1,448,316	1,156,660
The year 1925...	385,376,676	11,577,911	13,052,916
1926			
January	34,590,693	1,685,580	1,206,125
February	32,269,707	1,476,598	1,294,934
March	35,241,960	1,714,234	1,297,616
April	38,755,467	1,814,021	1,479,337
May	32,707,863	1,494,156	1,004,298
June	30,498,054	1,484,127	1,024,252
Fiscal year	398,306,436	15,413,144	16,046,267
July	34,123,992	1,327,874	1,318,556
August	32,459,844	1,453,909	1,326,442
September	36,901,003	1,432,378	1,145,406
October	27,965,148	1,247,115	1,069,243
November	32,694,793	1,210,868	1,274,446
December	32,140,569	1,373,234	1,202,069
The year 1926...	400,167,883	17,137,056	14,315,695
1927			
January	33,433,429	1,640,177	1,495,455
February	29,575,096	1,483,713	1,121,256
March	38,915,857	1,540,356	1,326,260
Nine months ...	297,933,446	12,713,323	11,279,348
Three months ...	101,916,818	5,208,328	3,941,643

March, 1927, against \$254,522 in March of last year. For the first quarters in 1927 and 1926 the values were \$824,307 and \$724,018, respectively.

JAPAN'S MACHINERY OUTPUT

Its Exports Growing—Good Market for American Special Machines

JAPAN'S progress toward industrialization, to the extent of supplying not only domestic needs for manufactured goods, but also an important volume for export, has been most noteworthy, according to a report received by the Department of Commerce from Trade Commissioner J. H. Ehlers, Tokio.

This development, he points out, has a two-fold aspect. On the one hand, the increased production of goods at home has stimulated the market for industrial machinery of all kinds while on the other the increased activity on the part of the Japanese machinery industry has limited the demand for certain classes of imported machinery.

The report says that American exporters may expect to find a gradual changing of their shipments to Japan from the smaller and simpler types of machines to the larger and more highly developed types, as Japan's industrial development proceeds. But for the present and immediate future it is not expected that Japan's industrial development program will be pushed rapidly, for in many industries overdevelopment is already evident.

It is difficult to obtain reliable statistics of Japanese machinery production, the report emphasizes, but consideration of the exports of machinery gives an indication of the progress made. In 1913 Japan imported industrial machinery valued at \$14,939,000 and exported a value of \$857,000; in 1925 imports had increased to \$28,161,000 and exports to \$2,779,000. Whereas the industrial machinery exports of the pre-war year represented less than 6 per cent of the imports, the ratio

had increased to approximately 10 per cent in 1925.

The accompanying table exports of industrial machinery by classes of equipment, shows the trend of Japan's exports since 1921 as compared with 1913. It should be remembered in examining these statistics that the type of machinery exported differs widely from that imported, and that the table includes some equipment that would hardly be classed as machinery in the United States, such as hand-power cotton gins, hand-power looms, etc. The figures for 1923 do not include exports from the port of Yokohama during July and August of that year, as the records for these months were destroyed in the earthquake of September, 1923.

Exports of Industrial Machinery From Japan (Value in Thousands of Yen)

Machinery and Parts	1913	1921	1922	1923	1924	1925	(11 Mos.) 1926
Steam boilers...	591	918	416	100	176	204	204
Pumps	274	284	201	265	278	248	
Metal or wood working	389	441	234	603	277	232	
Spinning and weaving	352	4,431	5,034	3,801	3,590	3,454	2,460
Others*	1,367	3,568	4,224	2,387	2,900	2,586	2,336
Total	1,719	9,253	10,901	7,039	7,458	6,771	5,480
†Total in thousands of dollars	857	4,465	5,211	3,420	3,072	2,779	2,572

*Includes cotton gins, 125,000 Yen.

†Conversion rates: 1913, \$0.4985; 1921, \$0.4825; 1922, \$0.478; 1923, \$0.4858; 1924, \$0.4119; 1925, \$0.4164.

Eleven month periods: 1925, \$0.4083; 1926, \$0.4694.

March production of automobiles in Canada, as reported to the Department of Commerce by the Dominion Bureau of Statistics, was 19,089 passenger cars and 3534 trucks, compared with 14,826 passenger cars and 3829 trucks in February and with 17,989 passenger cars and 4385 trucks in March, 1926.

Machinery Markets and News of the Works

BUSINESS DECLINING

Machine Tool Buying Has Shown Falling Off in April

Ford Motor Co. Buys Large Lot of Body Presses
—Briggs Mfg. Co. Also to Buy Equipment

ALTHOUGH a few machine tool builders report April business to have been the best of the year, this is not true of trade in general, which has shown a declining tendency in the past month. Some manufacturers estimate that the volume of orders fell off 25 per cent or more compared with the same month last year. Users of machine tools are hesitant about placing orders for new equipment.

New York

NEW YORK, May 3.

AN EASTERN builder of presses has received a large order, said to total a few hundred thousand dollars, for presses for the Detroit plant of the Ford Motor Co. It is reported here also that the Ford company will soon issue a large list of machine tool requirements. The volume of business generally is disappointingly small. Among the orders of the past week were the following: Chicago, Rock Island & Pacific Railroad, 36-in. x 14-ft. lathe; a York, Pa., manufacturer, one drill grinder; an Akron, Ohio, rubber company, a 4½-ft. radial drill; a machinery company in Cleveland, a 10-ft. boring mill; a furnace manufacturer in New Jersey, a universal cutter and tool grinder; a manufacturer in New York, two speed lathes; a grinding machine manufacturer at Springfield, Vt., 53-in. boring and turning mill; a Milwaukee company, a jig borer; a brass company at Port Huron, Mich., a die sinker; a typewriter plant at Hartford, Conn., a die sinker; a phonograph company, two bench lathes and two bench milling machines; a tool company at Toledo, Ohio, a 10-in. x 60-in. thread miller; an electrical company in New York, two 16-in. lathes; an aluminum company in Cleveland, a bench lathe.

The Anchor Post Iron Works, 9 East Thirty-eighth Street, New York, with main plant at Garwood, N. J., is reported to have closed negotiations for the purchase of a site at Canton, Baltimore, for a new branch plant, for which plans will soon be drawn. The initial unit will approximate 100,000 sq. ft. of floor space, and is reported to cost more than \$350,000 with machinery. It is expected to begin work in about 30 days.

Abraham Baxter, 638 Coster Street, New York, operating a plumbing and heating equipment works, has plans for a one-story factory, 100 x 100 ft., to cost about \$25,000 with equipment. De Rose & Cavalleri, 370 East 149th Street, are architects.

Doremus Schoen & Co., 64 Grand Street, New York, manufacturers of toys, have purchased the factory at Ainslie and Humboldt Streets, Brooklyn, for a new plant. Improvements will be made and equipment installed at an early date.

Schwartz & Gross, 347 Fifth Avenue, New York, architects, are preparing plans for a one-story automobile service, repair and garage building, to cost about \$110,000 with equipment.

The Duchess Tool Co., Beacon, N. Y., has plans under way for a new two-story machine shop, to cost about \$25,000 with equipment. C. B. Van Slyck, Library Building, is architect.

The Ford Motor Co. has placed a large order for automobile body presses with an Eastern builder. A few hundred thousand dollars is said to be involved. Other machinery requirements of the Ford Motor Co. will probably be made known soon. The Briggs Mfg. Co., Detroit, builder of automobile bodies, has let a contract for the rebuilding of its plant recently destroyed by fire, and will require new equipment also.

The Baltimore & Ohio Railroad has bought a number of tools against a list issued several weeks ago. The Elgin, Joliet & Eastern is preparing a small list which will be before the Chicago trade soon. Railroad buying is not in large volume, but considerable equipment inquired for earlier in the year is still to be purchased.

Milton J. Gordon, 513 Graybar Building, Lexington Avenue and Forty-third Street, New York, is in the market for a 3-ton road roller.

Fire, April 23, damaged a portion of the machine and rigging shop at the shipyard of the Theodore A. Crane's Sons Co., foot of Columbia Street, Brooklyn.

The Murtaugh Elevator Co., 535 West Thirty-third Street, New York, manufacturer of electric sidewalk elevators, has arranged for the removal of its plant to the building at 11-13 Davis Street, Long Island City, where increased capacity will be arranged.

The Central Railway Terminal & Cold Storage Co., Inc., Albany, N. Y., care of Moores & Dunford, 110 East Forty-second Street, New York, architects, has plans under way for a new 11-story ice-manufacturing and cold storage plant, to cost upward of \$1,000,000 with equipment. The company is operated by the Continental Terminals, Inc., recently formed to take over this and other properties at Cleveland and Detroit.

The New York Central Railroad Co., C. S. White, room 344, 466 Lexington Avenue, New York, purchasing agent, is asking bids until May 18 for two 300-kw. turbine exciters, serial contract 12-1927.

The White Co., Cleveland, manufacturer of motor trucks, has awarded a general contract to James Stewart & Co., 17 East Forty-second Street, New York, for its two-story factory branch, 150 x 200 ft., on 132nd Street, to cost more than \$115,000 with equipment. Hughes & Conrad, Union Mortgage Building, Cleveland, are consulting architects.

The Okonite Co., 501 Fifth Avenue, New York, manufacturer of insulated wire and cable, affiliated with the Okonite-Callender Co., same address, has plans for a two-story addition to its plant at Passaic, N. J., to cost about \$50,000.

The Mergenthaler Linotype Co., 29 Ryerson Street, Brooklyn, manufacturer of linotype machines and parts, has awarded a general contract to the Industrial Engineering Co., 50 Church Street, New York, for a new one-story factory at Long Island City, to cost about \$50,000.

The Servel Corporation, 51 East Forty-second Street, New York, manufacturer of electric refrigerating equipment, has disposed of its holding of common stock of the Wheeler Condenser & Engineering Co., with plants at Carteret, N. J., and Newburg, N. Y., the control passing to new interests who will continue production at the first-noted works. The Servel Corporation will retain the Newburg plant for two years, the works to be given over primarily to the production of gas-fired refrigerating units for domestic service on a schedule of about 100 per day. Frank E. Smith has been elected president to succeed Thomas H. Blodgett, resigned.

The Walden Knife Co., Walden, N. Y., has closed its plant for an indefinite period, effective April 30, due, it is stated, to foreign competition. During the World War, the factory gave employment to about 600 men at one time.

Bregman & Co., Inc., New York, operating a wood-working plant at 159 East Eighty-eighth Street, has awarded a

general contract to the Miller Levin Co., 406 West Thirty-eighth Street, for a new two-story plant, to cost close to \$50,000*with equipment. J. J. Gloster, 1440 Broadway, is architect.

The Aeroll Burner Co., Inc., 868 Hudson Avenue, Union City, N. J., manufacturer of oil burners and equipment, has concluded arrangements for the purchase of the three-story factory of the Holzman Silk Mfg. Co., Park Avenue, 126 x 200 ft., for \$110,000. The new owner will make improvements and will remove the present works to the new location.

The Standard Oil Co. of New Jersey, 26 Broadway, New York, has plans for a one-story addition at its Bayway refinery, Linden, N. J., to cost about \$40,000 with equipment.

The Board of Education, Bayonne, N. J., is considering the installation of manual training equipment in a proposed three-story senior high school on Thirtieth Street, to cost close to \$1,000,000. Gregory B. Webb, 10 East Forty-third Street, New York, is architect.

A. T. Blackburn, Inc., Newark, care of Alexander T. Schenck, 790 Broad Street, has leased the one-story building, 55 x 100 ft., at Mulberry and Chestnut Streets and will remodel for the manufacture of lamp stands and kindred specialties.

The Lionel Corporation, 605 Twenty-first Street, Irvington, N. J., manufacturer of electric toys, is having plans drawn for a one-story addition, 150 x 190 ft. W. E. Lehman, 972 Broad Street, Newark, is architect.

The Rauchbach-Goldsmith Co., 79 St. Francis Street, Newark, manufacturer of trunks, has acquired the former plant of the R. Neuman Hardware Co., totaling more than 140,000 sq. ft. of space, and will equip for a new factory.

The Board of Education, City Hall, Newark, R. D. Argue, secretary, is asking bids until May 11 for supplies for local schools, including wood-working machinery, clay-working machinery, iron and steel, hardware, steel lockers, etc., as per specifications on file.

Philadelphia

PHILADELPHIA, May 2.

PLANS have been filed by the Imperial Type Metal Co., 1226 North Howard Street, Philadelphia, for a one-story and basement plant, 45 x 90 ft., to cost \$75,000 with equipment, instead of a smaller sum, previously announced. A general contract has been let to Roberts & Roller, Inc., 1700 Walnut Street.

The Hajoca Corporation, Philadelphia, has been formed under Delaware laws with capital of \$3,000,000 and 250,000 shares of common stock, no par value, to take over four local companies engaged in the manufacture of plumbing equipment and supplies, including the Haines, Jones & Cadbury Co., 1136 Ridge Avenue; Keystone Supply & Mfg. Co., 927 North Ninth Street; the Bridgman Co., 120 South Thirtieth Street, and the Krupp Foundry Co., Stephen Girard Building, with plant at Lansdale, Pa. The first noted company also specializes in the manufacture of brass fittings and soil pipe, and the last in soil pipe and pipe fittings. The new company purposes to continue the different plants as heretofore. A bond issue of \$2,500,000 has been arranged to carry out the merger. J. Harvey Borton, heretofore head of the Haines, Jones & Cadbury Co., will be president of the new corporation.

Bids will be received by the Department of Supplies, City Hall, Philadelphia, E. J. Lafferty, director, until May 9 for one power shovel crane, drop frame trailer and gasoline engine driven air compressor, class 202.

Christian H. Fries, Overington Street and Frankford Avenue, Philadelphia, architect, has plans under way for a three-story automobile service, repair and garage building, to cost close to \$100,000 with equipment.

The Philadelphia Electric Co., Tenth and Chestnut Streets, Philadelphia, has closed arrangements for the purchase of the plants and systems of the Southern Pennsylvania Power Co., operating at Russellville, Oxford and other points in Chester County; the Northern Maryland Electric Co., with properties at Rising Sun, Port Deposit, Md., and vicinity; the Home Mfg. Light & Power Co., Elkton, Md., and the Eastern Power Co. The properties will be consolidated with those of the Philadelphia Electric Co., with construction of new power substations and high-tension transmission lines. It is proposed to furnish service to the different districts from the Conowingo hydroelectric generating plant of the purchasing company, construction of which is now in progress.

The Board of Education, Keystone Building, Philadelphia, plans the installation of manual training equipment in its proposed three-story junior high school at Montgomery Avenue and Thompson Street, to cost \$500,000, for which bids will be asked on a general contract in May. Irwin T. Catharine is architect for the board.

The Steel Heddle Mfg. Co., Twenty-first Street and Allegheny Avenue, Philadelphia, manufacturer of textile mill equipment, has filed plans for its five-story and basement

addition, to cost \$125,000, for which a general contract recently was let to the William Steele & Sons Co., 124 North Fifteenth Street.

The General Crushed Stone Co., White Haven, Pa., has arranged for the electrification of its local plant, and will install motors, controls and other electrical equipment. Headquarters are at Philadelphia.

The Department of Streets and Public Improvements, Chester, Pa., G. J. Hunter, superintendent, is asking bids on revised plans until May 10 for pumping machinery, valves, switchboards and other apparatus for a main pumping plant for the municipal waterworks. Plans at the office of the city engineer, or from Robert C. Wheeler, 36 State Street, Albany, N. Y., consulting engineer.

Luther B. Smith, Rossville, Pa., manufacturer of motor trucks, has awarded a general contract to W. E. Bushey, Lemoyne, Pa., for rebuilding the portion of his plant recently destroyed by fire. The new factory will cost about \$35,000. Witman & Royer, 47 East Market Street, York, Pa., are architects.

The Jacob Bloom Co., 1049 Frankford Avenue, Philadelphia, manufacturer of cedar chests, etc., has filed plans for its four-story addition, 40 x 80 ft., to cost upward of \$85,000 with equipment. A general contract has been let to the Haverstick-Borthwick Co., 1505 Race Street. Jacob Bloom is head.

The Board of Education, North Wales, Pa., is considering the installation of manual training equipment in its new two-story high school estimated to cost \$115,000, for which bids have been asked on a general contract. Irwin T. Catharine, Franklin Trust Building, Philadelphia, is architect.

The Wildman Mfg. Co., Norristown, Pa., manufacturer of textile machinery, has acquired property near the State hospital, and contemplates the early erection of a new plant to cost in excess of \$65,000. The company recently acquired the plant and business of the Richter Machine Co., Van Kirk and Erdrich Streets, Philadelphia, manufacturer of kindred machinery, and will remove to Norristown as soon as the new factory is available.

The Wilkes-Barre sales offices and service shop of the Westinghouse Electric & Mfg. Co. now are located in the new Westinghouse Building, 267 North Pennsylvania Avenue. J. B. Parks is branch manager and H. L. Huntley, service manager.

The Frassoni Iron Works, Conshohocken, Pa., incorrectly mentioned in our issue of April 21 as the Trassioni Metal Co., has acquired the local Duplex mills for the manufacture of steel tanks and boilers and expects to be in production by June 1. The company maintains an office in the Fuller Building, Philadelphia.

St. Louis

ST. LOUIS, May 2.

PLANS have been filed by the Universal Automobile Service Co., Missouri Theater Building, St. Louis, for a six-story service, repair and garage building, estimated to cost \$600,000 with equipment.

The Meeker Co., Third and Michigan Streets, Joplin, Mo., manufacturer of advertising novelties, has acquired property on East Seventh Street and plans the early erection of a new two-story plant, to cost close to \$40,000 with equipment.

The Public Service Co. of Oklahoma, Tulsa, has concluded negotiations for the purchase of the plants and properties of the Oklahoma Power Co., operating at Okmulgee and vicinity, and will make extensions and improvements, including transmission line construction. The company has construction in progress on the first unit of a steam operated electric generating plant at Weleetka, Okla. The purchasing company has arranged for a bond issue of \$8,500,000, a portion of the fund to be used for the acquisition and expansion.

The Southwestern Power Co., Alva, Okla., has plans for a one-story addition to its steam-operated electric generating plant, to cost \$50,000 with equipment.

The Board of Education, Pine Creek, Okla., contemplates the installation of manual training equipment in its proposed two-story high school, to cost \$180,000, for which plans will soon be drawn.

The Laclede Gas Light Co., 1017 Olive Street, St. Louis, operating the Laclede Power & Light Co., is said to have plans under way for an expansion program, including the enlargement of the electric generating station at Main and Mound Streets to cost \$500,000, with installation of a 12,500-kw. turbo-generator, boiler equipment, coal and ash-handling equipment, etc.; extensions in the gas-generating plant, to cost in excess of \$400,000 with equipment; new high pressure mains to cost \$300,000, and low pressure mains, \$354,000; extensions in transmission and distributing lines \$450,000, and other work. The entire project will cost approximately \$2,600,000.

The St. Louis-San Francisco Railway, St. Louis, is completing plans for an addition to the engine house and repair

The Crane Market

INQUIRIES for overhead equipment continue to accumulate and there is a fair volume of inquiry for locomotive cranes. The Baltimore & Ohio Railroad is understood to be in the market for locomotive cranes and there are a number of inquiries for single machines from contractors and industrial users.

Among recent purchases are:

Southern Railway, Washington, five standard railroad ditchers from the American Hoist & Derrick Co.

Patrick McGovern, Inc., New York, three 15-ton crawl-tread locomotive cranes from the Industrial Works.

Grossman Brothers & Rosenbaum, 82 Willow Avenue, New York, two 5-ton, 58-ft. span and one 2-ton, 30-ft. span, 3-motor overhead cranes, reported purchased from a builder in the Northwest.

Central Structural Steel Co., New York, a 5-ton, 80-ft. span, 3-motor overhead crane from the Shepard Electric Crane & Hoist Co.

Columbia Steel Co., Butler, Pa., a 10-ton, 80-ft. span overhead crane from the Cleveland Crane & Engineering Co.

Pompton Crushed Stone Co., Pompton Lakes, N. J., a bucket crane from the Bergan Schmidt Co., through Thaleg & Hoch, Inc., Chicago.

Booth, McDonald & Co., Ltd., New Zealand, a crawl-tread shovel from the Bergan Schmidt Co.

Tappan Stove Co., Mansfield, Ohio, two 1-ton, motor-driven transfer cranes, one 2-ton hand power transfer crane and one 2-ton jib crane from H. D. Conkey & Co.

Scully Steel & Iron Co., Chicago, a 5-ton hand power crane from H. D. Conkey & Co.

Stuck Iron & Foundry Co., St. Louis, a 2-ton motor-driven crane from H. D. Conkey & Co.

Vermont Marble Co., Proctor, Vt., a 2-ton, motor-driven crane from H. D. Conkey & Co.

Russel & Erwin Co., St. Louis, a 3-ton hand power crane from H. D. Conkey & Co.

National Radiator Co., Johnstown, Pa., a 1½-ton motor-driven crane from H. D. Conkey & Co.

Seymour Mfg. Co., Seymour, Conn., a 1-ton, motor-driven overhead crane from H. D. Conkey & Co.

shops at its North Side shops at Springfield, Mo., with enlargements in the car shops at the West Side yards, same city, to cost close to \$100,000 with equipment. F. G. Jonah is chief engineer.

The City Council, Monette, Ark., plans the installation of pumping equipment, with elevated steel water tank and tower, in connection with extensions and improvements in the municipal waterworks and sewage system. The entire project will cost about \$65,000. A. C. Moore, Joplin National Bank Building, Joplin, Mo., is engineer.

The Producers Cold Storage Co., Chillicothe, Mo., is said to be planning the construction of a new cold storage and refrigerating plant at Albany, Mo., to cost close to \$35,000 with equipment. J. M. Peters is head.

The Arkansas Power & Light Co., Pine Bluff, Ark., is arranging a budget of about \$3,000,000 for extensions and improvements in power plants and transmission lines, and street railroad system during 1927, including additional equipment.

formerly occupied by the Columbia Graphophone Co. The products will include wire forms, rolled thread machine screws, rivets, light stampings, battery caps and clips and miscellaneous small parts.

The Pawtucket Gas & Electric Co., Main Street, Pawtucket, R. I., has completed foundations for a two-story, 20 x 20 ft., blacksmith shop. Plans are private.

Fay, Spofford & Thorndike, 200 Devonshire Street, Boston, engineers, are drawing plans for a one-story, 75 x 180 ft., manufacturing plant at Ashland, Mass., for the Warren Telechron Co., for which motors and miscellaneous equipment are required.

G. S. Pease, 115 Stafford Street, Worcester, Mass., engineer, is preparing plans for four one- and two-story manufacturing plants for George M. Thompson, 41 Mildred Avenue, Mattapan, Mass. Mr. Thompson for several years was associated with the Worcester wire industry.

Bids are being taken on a one-story machine shop at Harvard Street and Alton Place, Brookline, Mass., for H. M. Rambach, 18 Tremont Street, Boston.

Plans have been completed by Charles R. Greco, 11 Beacon Street, Boston, for a three-story school for deaf mutes at Kearsarge Avenue and Winthrop Street, Boston, which will include several wood-working and metal-working shops. Francis E. Slattery, room 1009, City Hall Annex, Boston, is chairman of the schoolhouse committee.

Thé Fairchild Lock Co., New Haven, Conn., recently organized, has purchased the former plant of the Rowe Calk & Chain Co., Plantsville, Conn., bankrupt, and will take immediate possession.

The S. A. Woods Machine Co., 27 Damrell Street, South Boston, manufacturer of wood-working machinery, has concluded negotiations for the purchase of a controlling interest in the W. H. Mershon Co., Saginaw, Mich., manufacturer of heavy machinery for saw mills, planing mills, etc. The new owner will continue the Saginaw plant as a branch, operating the Mershon company as a subsidiary. I. J. Budlong, vice-president, will be in charge.

The Pollard Lunch Cart Mfg. Co., Chelmsford, Mass., manufacturer of lunch wagons, has secured the former plant of the Newton Mfg. Co., Lowell, Mass., and plans the early removal of its business to the new location where additional equipment will be provided.

Following its recent acquisition of the Abrasive Co., Philadelphia, manufacturer of grinding wheels and abrasive materials, the Simonds Saw & Steel Co., Fitchburg, Mass., has arranged for a bond issue of \$1,200,000, to be used in part for the purchase of the new interest as well as for general expansion in the line of abrasive production, a new division of the business.

A. H. Merriman & Sons, Inc., Englewood Avenue, Waterbury, Conn., is completing plans for an addition to its cold storage and refrigerating plant, for which bids will soon be asked. C. Jerome Bailey, Waterbury, is architect.

The Automatic Stoker Corporation, Hartford, Conn., organized last week by Frank Cox, 96 Woodstock Street, and associates with capital of \$50,000, is said to be planning the operation of a local plant for the manufacture of automatic stoking equipment and heating apparatus.

New England

BOSTON, May 2.

THE machine tool trade in the closing days of April was comparatively quiet in this territory. Sales were scattered and of no real significance. New England, however, is better employed than a month ago, particularly in the metal-working industries, although the volume of business is smaller than a year ago. April was a better month with some machine tool dealers who had a poor March.

It is recognized that New England industries generally need machine tools to speed up production to be in position to compete with other sections of the country, but business with many is not developing as fast as anticipated and there is a tendency to conserve cash resources. As a result, competition among machine tool dealers is perhaps keener than at any time since the war. Prices are shaded to close sales of both new and used tools. Certain houses report fairly important sales about to be booked, but prospective buyers want equipment this month with a July 1 dating. On the other hand some of New England's largest industries have stated that they will purchase new equipment as soon as business conditions warrant, and there is no quibbling about price.

The Clark Metal Products Co., Inc., 490 Hancock Avenue, Bridgeport, Conn., has been organized with paid-up capital of \$75,000 and is taking over a part of the machinery operated by the metal division of the Warner Brothers Co., corset manufacturer, which is in process of liquidation, though the manufacture of corsets will be continued. Lancaster P. Clark is president and treasurer; William West, for many years with the Warner Brothers Co., is vice-president, and Jonathan Grout is secretary. H. B. Merwin, vice-president of the Bridgeport Trust Co., and the officers, constitute the board of directors. The Clark Metals Products Co. has rented space in the building

Chicago

CHICAGO, May 2.

AFURTHER recession in machine tool purchases is noted in this district and sales in April will not total above 65 per cent of the volume in the same period a year ago. The Rock Island has purchased a cylinder grinder, a 6-ft. radial drill, a 36-in. shaper and a carwheel borer. The International Harvester Co. has placed several tools for its Rock Island, Ill. plant and the Western Electric Co., Chicago, is closing for a number of small lathes. A Rockford, Ill., manufacturer bought a 16-in. shaper.

Fresh inquiry from the railroads includes a 16-in. x 36-in. precision lathe from the Northern Pacific; a boring mill and two upsetting machines from the Union Pacific, a structural punch from the Chicago, Burlington & Quincy, and a No. 1 A 2½-in. Warner & Swasey, or equivalent, universal turret lathe from the Rock Island. The Elgin, Joliet & Eastern is tabulating a small list. The Chicago Rapid Transit Co. is contemplating the erection of consolidated shops at Niles Center, Ill.

The Star-Peerless Wall Paper Co., Joliet, Ill., is planning the reconstruction of a boiler plant and factory recently destroyed by fire, with a loss of \$250,000.

The Rapid Transit Co., Chicago, is planning the erection of a consolidated car repair shop at Niles Center, Ill., at a cost of \$4,500,000.

The Northwest Side Iron Works, 4200 Diversey Boulevard, Chicago, will build a steel fabricating shop, 100 x 162-ft. Harry Miller is structural engineer.

The Chicago Machinery Mart Building Corporation, 38 South Dearborn Street, will build a two story garage, 149 x 340-ft., to cost \$300,000. D. D. Meredith, 5750 Sheridan Road, is architect.

Samuel N. Crowen, 22 West Monroe Street, Chicago, is preparing sketches for a five-story factory for the manufacture of screw machine products, to cost \$850,000. The name of the owner is temporarily withheld.

Page & Ludwick, 14 East Jackson Boulevard, Chicago, has recently been appointed sales representatives for the Milwaukee Electric Crane & Mfg. Corporation, Milwaukee.

The F. H. Hill Co., 944 West Washington Boulevard, Chicago, manufacturer of caskets, fittings, etc., has awarded a general contract to the Austin Co., for a seven-story factory addition, to cost \$150,000.

The Halliday Elevator Co., Cairo, Ill., is said to be planning to rebuild the portion of its grain elevator destroyed by fire April 21, with loss reported at \$200,000 including equipment.

The Board of Education, Dixon, Ill., contemplates the installation of manual training equipment in its proposed new high school estimated to cost \$300,000, for which plans will be drawn soon.

The Coliseum Battery Co., 1608 South Wabash Avenue, Chicago, has plans under way for a new three-story factory, to cost upward of \$75,000 with equipment. S. C. Finck, 35 South Dearborn Street, is architect.

The Northwestern Paper Co., Cloquet, Minn., has preliminary plans for a new sulphite pulp mill, reported to cost more than \$100,000 with machinery. It is expected to begin work during the summer.

The chief civil engineer, National Park Service, Yellowstone, Wyo., is asking bids until May 15 for mechanical, electrical and other supplies for the fiscal year beginning July 1, 1927, including steel hoisting rope, steel pins, turnbuckles, washers, bolts, hangers, wire rope clips, lightning arresters, metal molding, crowbars, shovels, cast iron pipe, steel pipe, pipe fittings, flanges, wrought iron pipe, steam and water valves, abrasives, nails, nuts, rivets, wire, steel wool, horseshoes, welding rods, babbitt metal, iron, steel, bolts, brackets, door hangers, metal lath, locks, lock sets, enameled ware, knives, choppers, knife sharpeners, road machinery and parts, steel dump bodies for small trucks, road graders, etc.

M. O. Nathan, 123 West Madison Street, Chicago, architect, has asked bids on a general contract for a two-story automobile service, repair and garage building, to cost close to \$100,000 with equipment. The same architect is also completing plans for a similar three-story structure to cost approximately \$250,000 with equipment.

The Alexander Industries, Inc., Englewood, Colo., J. Donald Alexander, president, is considering plans for a new aircraft manufacturing plant in the vicinity of the Pueblo airport, Pueblo, Colo.

The Minneapolis Gas Light Co., Minneapolis, Minn., will begin work on a 1927 expansion program to cost about \$500,000. It will include the installation of additional gas-

generating machinery and auxiliary equipment to increase the output from 17,000,000 to 24,000,000 cu. ft. per day.

The Storm Ball Bearing Co., Oak Park, Chicago, has acquired a one-story plant, 100 x 260 ft., at 1842-54 South Fifty-fourth Street, Cicero, Ill., for \$100,000, to replace its former factory in the Oak Park district, recently destroyed by fire.

The Hill Motor Sales Co., Oak Park, Chicago, is completing plans for a two-story addition to its service, repair and garage building, to cost \$150,000 with equipment. E. C. Roberts, 105 North Clark Street, Chicago, is architect.

Wood & Weber, Tramway Building, Denver, Colo., consulting engineers, have preliminary plans for a new power house to be constructed in Nyden Park, a new subdivision development. A company is being organized to carry out the project.

Bids will be received by the Construction Division, Veterans Bureau, Washington, until May 17 for one 100,000-gal. steel water tank and tower, and water-softening system for the Edward Hinds, Jr., hospital, Maywood, Ill.

Buffalo

BUFFALO, May 2.

CONTRACT has been let by the Harrison Radiator Corporation, Washburn Street, Lockport, N. Y., manufacturer of automobile radiators, to the Austin Co. for a one-story addition to its foundry, including alterations in present unit at 64 Lock Street, reported to cost more than \$175,000.

The Curtiss Aeroplane & Motor Co., Kail Street, Buffalo, is developing production schedules close to double the output of 1926. The company has contracts for planes of different types, with estimated volume of output at \$4,000,000 during 1927, as compared with \$2,500,000 during the past year.

The Monitor Furniture Co., West Fifth and Clinton Streets, Jamestown, N. Y., has acquired the plant and business of the Standard Table Co. and will take over the property at once. The factory will be remodeled and additional machinery installed.

The O. M. Edwards Co., 412 Broadway, Syracuse, N. Y., manufacturer of hardware products, will soon begin the erection of a one-story addition at Plum and Solar Streets, for which a general contract has been let to the H. K. Ferguson Co.

The O. M. Edwards Co., Syracuse, N. Y., manufacturer of hardware specialties, has let a contract to the H. K. Ferguson Co., Cleveland, for a factory extension, one building to be 60 x 160 ft., five stories, and the other 120 x 120 ft., one story. Work is to be completed in five and a half months. Harold Edwards is vice-president and general manager.

South Atlantic States

BALTIMORE, May 2.

PLANs have been authorized by the Western Maryland Railway Co., Baltimore, for the rebuilding of the portion of its repair shops at Elkins, Md., recently destroyed by fire, with loss reported in excess of \$100,000 including equipment. It is understood that the new buildings will be located on another site; the main unit will be 700 ft. long.

The Duplex Envelope Co., 1339 West Broad Street, Richmond, Va., has acquired property on West Broad Street and plans a one-story top addition and other improvements to cost in excess of \$150,000.

E. A. Close & Son, Madison, Va., have inquiries out for a number of wood-working tools, including lathes, band saw, shaping machine, hand drill press, jointer, 24-in. single surfacer, and floor swing saw table, to be installed in a proposed new plant, for which plans are nearing completion.

The Gaston County Dyeing Machine Co., Stanley, N. C., R. F. Craig, head, has acquired property at Mount Holly, N. C., as a site for a new plant for the manufacture of dyeing machinery and parts. The initial unit is reported to cost more than \$25,000 with equipment.

The Board of Trustees, Clemson Agricultural and Mechanical College, Clemson College, S. C., is having plans drawn for a new building for the Department of Engineering and Architecture, for which the Legislature has granted an appropriation of \$250,000 including equipment. It is expected to ask bids this month. Rudolph E. Lee, Clemson College, is architect.

The Board of District Commissioners, District Building, Washington, is asking bids until May 16, for a double unit water softener, zeolite type, for the sewage division; until May 18 for laundry machinery and equipment for the district training school.

S. Slater & Sons, Inc., Webster, Mass., plans the complete electrification of a proposed new cotton mill to be constructed at Marietta, S. C. A power substation will be

built. The entire project will cost in excess of \$2,000,000. J. E. Sirrine & Co., Greenville, S. C., are architects and engineers.

The American Stores Co., 610 Forrest Street, Baltimore, has plans for a five-story storage and distributing plant, 100 x 125 ft., with installation of elevating, conveying and other equipment, to cost about \$125,000. A. B. Kister, 1204 Chancellor Street, Philadelphia, is engineer.

The Richmond Corrugated Paper Co., 306 South Sixth Street, Richmond, Va., and the Fiber Board Container Co., Williamsburg Avenue, have completed plans for a consolidation, both companies to continue individual operations for the time being and later to merge facilities. An expansion program will be carried out for increase in present output. David J. Donati is president, and Charles W. Throckmorton, Jr., treasurer.

The Paschal Metal Mines, Inc., Masonic Building, Augusta, Ga., is planning the purchase of general mining equipment for installation at local copper and lead mines.

The quartermaster, intermediate depot, Camp Holabird, Md., is asking bids until May 21, for two engine-driven water pumps, fire engine type; two propeller shafts, two auxiliary water tanks, two clutch joints, etc.

The Southern Railway System, Charlotte, N. C., G. L. Sitton, chief engineer, is said to be planning the construction of a one-story repair shop in the vicinity of Rome, Ga., with boiler house and other structures, to cost in excess of \$85,000 with equipment.

The Wilmington Gas Co., Wilmington, Del., has begun an expansion program at its gas-generating plant, to include the installation of a new water gas set, compressor units, washing machinery and auxiliary equipment.

The Atmospheric Nitrogen Corporation, operated by the Allied Chemical & Dye Corporation, 61 Broadway, New York, is reported to be considering the construction of a power plant at its proposed nitrogen plant at Hopewell, Va., to cost more than \$2,500,000 with machinery. The entire project will cost upward of \$15,000,000.

Cleveland

CLEVELAND, May 2.

MACHINE tool sales were light the past week and April was a rather disappointing month, as the volume of business was not quite as large as that in March. New business is confined to single machines from a wide range of industries, but very few orders are coming from the automotive industry, which for a long time has supplied the bulk of the business in this territory. There is no buying by the railroads in this market. New inquiry is not keeping up to its recent volume.

The Brandes-Merrick Machinery Co., 1314 Keith Building, Cleveland, has been organized to engage in the sale of new and used machine tools and electric traveling cranes. Associated with the company are Frank A. Brandes, who has been in the machinery business in Cleveland for a number of years under the name of the Brandes Machinery Co. and E. H. Merrick, who has been Cleveland district sales manager of Manning, Maxwell & Moore, Inc. The latter company is discontinuing its Cleveland office. Mr. Brandes and Mr. Merrick were at one time associated with Hill, Clarke & Co., Chicago, as sales engineers and the former had charge of the company's Cleveland office until it was discontinued several years ago. Mr. Merrick has been connected with Manning, Maxwell & Moore, Inc., for 10 years, having been district manager in Cincinnati before being transferred to Cleveland.

The Colonial Iron Works Co., 875 East Sixty-seventh Street, Cleveland, has let a contract for the erection of the steel work of its new building at 17625 St. Clair Avenue. Most of the steel is now being fabricated in the company's own shop. When the new plant is completed, the company will employ about 100 men and will be able to handle a larger tonnage of structural steel and plate work for builders of plant and power house handling equipment. Lionel M. Stern is president and treasurer.

The Breckenridge Machine Co., Cleveland, which has been occupying the former plant of the Coburn Machine Tool Co. on Ivanhoe Road, has purchased from the Bishop-Babcock Co. the plant formerly occupied by the Lennox Chemical Co., Bliss Road and the Nickel Plate Railroad. The property consists of 12 acres of land and a modern one-story factory and several small buildings, all containing 60,000 sq. ft. of floor space. The Breckenridge company is engaged in jobbing machine work.

The New York, Chicago & St. Louis Railroad has placed contract with the Austin Co., Cleveland, for a one-story, 80 x 320 ft., warehouse on East Forty-fifth Street near Woodland Avenue. The building will include a boiler room.

The American MonoRail Co., West Sixty-seventh Street and Pear Avenue, Cleveland, has increased its capacity by adding a 50 x 70 ft. extension to its floor space.

The Western Electric Co., 6215 Carnegie Avenue, Cleveland, manufacturer of telephone equipment, cables, etc., with headquarters at 195 Broadway, New York, has asked bids on a general contract for a one- and five-story factory branch and distributing plant at East Ninety-third Street and Woodland Avenue, to cost about \$500,000 with equipment. Christian, Schwarzenberg & Gaede, 1900 Euclid Avenue, Cleveland, are architects and engineers.

The National Power Machinery Co., 1928 Scranton Road, Cleveland, is planning the purchase of several uniflow engine-generator units, from 100- to 600-kw. capacity.

The Smith Incubator Co., 1920 West Seventy-seventh Street, Cleveland, will soon take bids for a one-story plant to cost in excess of \$200,000 with equipment. J. M. Walsh is company engineer.

The Massillon Power Shovel Co., Massillon, Ohio, has been organized to manufacture steam shovels and hammers. The new company is a reorganization of the Massillon Foundry & Machine Co. and will make the line of hammers that have been manufactured by that company and in addition the line of steam shovels formerly made by the Russell Co., Massillon. E. H. Birney, formerly president Peerless Drawn Steel Co., Massillon, is the prime mover in the organization of the new company.

Cincinnati

CINCINNATI, May 2.

ALTHOUGH five important machine tool builders state that bookings in April were the best this year, conditions, from the standpoint of sales and production, remain unsatisfactory. Some manufacturers estimate that the volume of orders the past month fell off about 25 to 30 per cent compared with the same month last year. Adoption of a generally conservative buying policy by machine tool users is in large measure responsible for the hesitation in closing for equipment. Outstanding inquiries are of sizable proportions, but the conversion of even a moderate number into actual orders in the next 30 days is doubtful.

The Baltimore & Ohio is understood to have purchased tools against its list, some of the machines being placed with local builders. The General Electric Co. has bought two 6-ft. right line radial drills for its Pittsfield, Mass., plant, while the Jones & Laughlin Steel Corporation has contracted for a 27-in. x 20-ft. engine lathe. A Springfield, Vt., company has bought a 53-in. boring mill.

The Delco-Remy Corporation, Dayton, Ohio, subsidiary of General Motors Corporation, has begun the manufacture of shock absorbers at its East First Street plant. Patent rights for the shock absorber were purchased by the company from Ralph Lovejoy.

The Ornamental Iron & Wire Works, 8-16 North Canal Street, Dayton, Ohio, has recently taken over adjoining property for expansion. Otto M. Buehner and W. H. Bullock head the company.

The Paul A. Sorg Paper Co., Manchester Avenue, Middletown, Ohio, has awarded a general contract to F. K. Vaughn, Hamilton, Ohio, for extensions and improvements in its two-story mill, to cost more than \$50,000 with equipment.

The Bledsoe County Board of Education, Pikeville, Tenn., is considering the installation of manual training equipment in its proposed two-story grade and high school, to replace a structure recently destroyed by fire, to cost about \$90,000. James H. Gauntt, Hamilton National Bank Building, Chattanooga, Tenn., is architect.

The Moline-Hooper Co., Memphis Tenn., farm and agricultural implements, has awarded a general contract to F. J. Ozanne, Empire Building, for a new three-story storage and distributing plant, to cost \$150,000 with equipment.

The Buckeye Cotton Oil Co., Cincinnati, operated by the Procter & Gamble Co., same city, is completing arrangements for its new mill at Raleigh, N. C., for which a general contract has been let to the J. E. Beaman Construction Co., Raleigh, consisting of main drill-press unit, steam power plant, cleaning building, laboratory, storage and other structures, to cost close to \$400,000 with machinery. Robert & Co., Bona Allen Building, Atlanta, Ga., are engineers.

Louis H. Bull, Volunteer Life Building, Chattanooga, Tenn., architect, has plans under way for a new four-story and basement automobile service, repair and garage building, 140 x 160 ft., to cost close to \$400,000 with equipment.

It is expected to ask bids on a general contract early in June.

The Board of Education, Milford, Ohio, is said to be planning the installation of manual training equipment in a proposed two-story addition to the high school, to cost \$100,000, for which bids are being asked on a general contract. Garber & Woodward, 4 West Seventh Street, Cincinnati, are architects.

The Brown Instrument Co., Philadelphia, has opened a branch office at Cincinnati at 718 First National Bank Building, with J. R. Green in charge as district manager.

Pittsburgh

PITTSBURGH, May 2.

APRIL business fell behind March with most machinery dealers, but a few who did not do as well in March as others appear to have caught up in the month just ended. The last week of April was not marked by much activity although a fair number of orders for single items was closed. New inquiry is not active.

The Bronze Metal Co., Pittsburgh, has acquired a site, 75 x 200 ft., on South Avenue, and is said to be contemplating a new plant at that location.

The American Window Glass Co., Farmers' Bank Building, Pittsburgh, has awarded a general contract to the Bollinger-Andrews Construction Co., Empire Building, for the erection of an addition to its plant at Belle Vernon, Pa., including remodeling of a portion of the present works, to cost upward of \$350,000 with equipment.

The Sheehan Tire & Battery Service Co., Adams and Bedford Streets, Johnstown, Pa., has plans for a new three-story service, repair and headquarters building, to cost \$40,000 with equipment. O. P. Thomas, Park Building, is engineer.

The General Electric Co., Schenectady, N. Y., Sprague Electric Division, is said to be planning a one-story addition to its plant at New Kensington, Pa., 60 x 235 ft., to cost about \$60,000.

The Rolland Sheet Glass Co., Clarksburg, W. Va., recently organized with a capital of \$100,000, is said to have concluded negotiations for the purchase of the plant and business of the Lafayette Window Glass Co., Northview, near Clarksburg. Plans are under way for an addition for the manufacture of sheet glass products, to cost in excess of \$200,000 with equipment. Charles and Eugene Rolland head the new company.

The Board of Education, Martinsburg, W. Va., plans the installation of manual training equipment in a new two-story high school to cost \$325,000, for which bids are being asked on a general contract until May 12. Frampton & Bowers, 414 Eleventh Street, Huntington, W. Va., are architects.

The Board of Education, North Braddock, Pa., plans the installation of manual training equipment in its proposed two-story and basement high school, for which new bids will soon be asked on general contract, to cost \$250,000. Carlisle & Sharrer, Martin Building, Pittsburgh, are architects.

The Iron City Engineering Co., Union Trust Building, Pittsburgh, has leased the three-story building at 511-13 First Avenue, for a new plant.

The Barney Machinery Co., Union Trust Building, Pittsburgh, has been appointed sales agent in this district for the Milwaukee Electric Crane & Mfg. Corporation.

Gulf States

BIRMINGHAM, May 2.

THE Gulf Pipe Line Co., Gulf Building, Houston, Tex., is considering the installation of a new pipe line in the West Texas Plains district, with pumping stations, storage and distributing plants, etc., about 400 miles, to cost upward of \$6,000,000.

The Panhandle Light & Power Co., Amarillo, Tex., operated by the Kansas City Light & Power Co., Kansas City, Mo., plans the construction of a new power house at Magic City, Tex., to cost about \$90,000 with equipment.

The Mosher Steel & Machinery Co., South Lamar Street, Dallas, Tex., has acquired a tract of about 30 acres and is reported to be planning the erection of a new factory to cost more than \$45,000.

The Common Council, Big Lake, Tex., plans the installation of electric-operated pumping machinery in connection with a proposed municipal waterworks. The entire project will cost about \$80,000. The Devlin Engineering Co., Central Building, Amarillo, Tex., is engineer.

The Tulane Ice Mfg. Co., New Orleans, recently organized

with a capital of \$75,000 by Robert W. Taylor, 8001 Hickory Street, and associates, will erect a one-story plant to cost about \$45,000 with machinery. Favrot & Livaudias, Hibernia Building, are architects.

L. R. Camp, American Trust Building, Birmingham, engineer, has inquiries out for an electric alternator, about 200 kw., 3 phase, 60 cycles, belted type, with exciter, switch-board and accessory equipment.

The Southwestern Gas & Electric Co., Shreveport, La., has arranged for a bond issue of \$5,000,000, a portion of the proceeds to be used for extensions and improvements in power plants and system.

The Southwestern Graphite Co., Burnet, Tex., has awarded a general contract to the Southwestern Engineering Co., Los Angeles, for rebuilding the portion of its plant recently destroyed by fire. The new mill will provide for increased output over the former plant and is estimated to cost more than \$200,000 with machinery, the latter to represent an investment of close to \$75,000.

The Board of Trustees, North Texas Agricultural College, Arlington, Tex., is considering the construction of a new trades and industry building to cost approximately \$65,000, and a new science building to cost about \$150,000. It is expected to arrange appropriations at an early date.

The Boykin Machinery & Supply Co., Laurel and Second Streets, Beaumont, Tex., manufacturer of oil well machinery, has work in progress on a new one-story foundry, 100 x 200 ft., for which a general contract recently was let to the Austin Co. It is estimated to cost about \$80,000.

The Big Lake Oil Co., San Angelo, Tex., has authorized the electrification of its properties in the Reagan County oilfields, to include the installation of motors, controls and other electrical apparatus. Headquarters are in the Benedum-Trees Building, Pittsburgh.

The Rio Grande Valley Cold Storage Co., McAllen, Tex., has plans under way for a new two-story cold storage and refrigerating plant, 110 x 200 ft., to cost about \$135,000 with equipment.

The United States Property and Disbursing Officer, Vicksburg, Miss., is asking bids until May 26 for an electric lighting plant, water distributing system and sewer plant at the Government camp site, Biloxi, Miss., circular 9.

The Alabama State Docks Commission, State Office Building, Mobile, Ala., is asking bids until May 19 for equipment for a coal and material-handling plant. William I. Sibert is chairman.

A. B. and B. M. Ayres, Bedell Building, San Antonio, Tex., architects, are preparing plans for a new automobile service, repair and garage building, to cost about \$90,000 with equipment.

The City Council, Amarillo, Tex., is considering the installation of pumping machinery and power equipment in connection with proposed extensions in the municipal waterworks, for which a bond issue of \$300,000 will be voted on May 28.

The Star Foundry, Steel & Machine Co., care of A. A. Koch, San Angelo, Tex., recently organized by Mr. Koch and associates, is said to be planning the construction of a one-story foundry on the Robert Lee Road, Sweetwater, Tex., where site has been secured. It is estimated to cost about \$25,000 with equipment.

The Board of Education, Natchez, Miss., plans the installation of manual training equipment in a proposed high school to cost \$250,000, for which bids have been asked on a general contract. P. J. Krouse, M. & W. Building, Meridian, Miss., is architect.

The Santa Fe Lime Rock Corporation, 103 East Main Street, South Gainesville, Fla., now establishing a local plant, is planning the purchase of a power shovel, steam or gasoline type.

Indiana

INDIANAPOLIS, May 2.

PLANS are being prepared for improvements in the power house at the factory of the Henry Wels Co., Elkhart, Ind., to cost about \$25,000 with equipment. Hubert Miller, Monger Building, is architect.

The Chicago Pump Co., 2300 Wolfram Street, Chicago, is said to be considering the erection of a new plant at La Porte, Ind., to cost upward of \$100,000 with machinery. N. H. Well is secretary.

The Sink & Edwards Co., 219 North Delaware Street, Indianapolis, operating a furnace and sheet metal works, has taken bids on a general contract for a new two-story plant, 50 x 200 ft., to cost about \$40,000 with equipment. W. H. Albersmier, Rauh Building, is architect.

The Rex-MacHughes Mfg. Co., Green, Iowa, manufacturer of sanitary farm equipment, etc., has leased a portion of the former plant of the Haynes Motor Co., Kokomo, Ind., totaling about 5000 sq. ft. of floor space, for the establishment of a new branch plant.

The Board of Education, Evansville, Ind., is completing plans for the early construction of a boys' vocational school at the central high school, to cost \$120,000 including new gymnasium, for which bids on general contract recently have been asked. Frank T. Schlotter, 113 South Fourth Street, is architect.

Carl J. Horn, Citizens' Loan and Trust Building, Logansport, Ind., architect, has plans for a new four-story and basement automobile service, repair and garage building, to cost close to \$90,000 with equipment.

The Chicago & Eastern Illinois Railroad Co., 332 South Michigan Avenue, Chicago, will take bids on a general contract early in May for its new repair shops at Evansville, Ind., to cost \$200,000 with equipment. L. S. Kinnard, Danville, Ill., is chief engineer.

The Remy-Delco Co., Anderson, Ind., manufacturer of automobile starting and lighting equipment, a division of the General Motors Corporation, will soon lay foundations for a one-story addition, 240 x 400 ft., to cost in excess of \$400,000 with equipment.

The Board of Education, Madison, Ind., is planning the installation of manual training equipment in a new two-story high school, to cost \$190,000, for which plans will be prepared by Henkel & Hanson, Connorsville, Ind., architects.

The Rhodes-Yerrick Motor Co., 222 North Lafayette Street, South Bend, Ind., local representative for the Dodge automobile, is completing plans for a one-story and basement service, repair and garage building, 66 x 135 ft., at Mishawaka, Ind., to cost about \$70,000 with equipment. W. W. Schneider, 120 South Main Street, South Bend, is architect.

Milwaukee

MILWAUKEE, May 2.

ENCOURAGEMENT was afforded the machine-tool trade during the final week of April by a substantial improvement in inquiry, although this did not presage any large-lot business. The aggregate of April sales is reported as fair and about equal to March. General industrial demand contributed the major support. Manufacturers of automotive parts and equipment are doing some buying, but it is largely for replacement or unimportant extensions of capacity, which is well occupied. The trend of industrial employment is still upward.

The Universal Motor Co., 39 Ceape Street, Oshkosh, Wis., manufacturer of marine and industrial gasoline engines, has plans for the construction of a new plant, 150 x 378 ft., with a power house, 40 x 50 ft., on Harrison Street, using the present equipment with substantial additions. The total investment will be upward of \$100,000. The present plant will be placed on the market when the new works is ready about July 1 or 15. E. H. Fahrney is president.

The Cream City Boiler Co., Thirty-seventh Avenue and Lapham Street, Milwaukee, is reorganizing its plant and installing a complete line of sheet metal-working machinery, thus creating a new steel products division which will specialize in the manufacture of automotive and industrial sheet metal parts. William H. Gaulke, for many years connected with the Western Metal Specialties Co., Milwaukee, has been appointed chief engineer and general manager of the new division.

The United States Engineer Office, Federal Building, Milwaukee, is advertising for sealed bids to be opened May 24 for furnishing and delivering one 60-ft. steel sidewheel tug.

The Harnischfeger Corporation, 3834 National Avenue, Milwaukee, is completing improvements and additions to its gasoline excavator division which will make possible an output of 50 units per month.

Walter Point, 237 West Ayer Street, Ironwood, Mich., has plans by N. A. Nelson, local engineer, for additions to his service garage costing about \$40,000. A second story will be added to the present building, 40 x 140 ft., and a two-story addition, 30 x 140 ft., will be erected. The shop area will be increased and considerable miscellaneous equipment installed.

The General Metal Products, Inc., Platteville, Wis., has been incorporated to manufacture hardware, advertising novelties and other metal specialties. The principals are Fred Kettler, David J. Weigel and David Gardner, Jr., all of Platteville. Definite plans concerning plant and equipment are not yet available.

The Super-Steel Products Co., Milwaukee, established several months ago to manufacture steel sash at Hawley and State Streets, has leased larger space at 317-325 McKinley Avenue, and will add materially to its equipment.

The Barlow & Seelig Mfg. Co., Ripon, Wis., manufacturer of washing machines, has been acquired by a group of local capital, represented by R. C. Stuart, Marshall Scott, H. A. Bumby, J. H. Bumby and John G. Seelig, the last named

being one of the founders of the business who retains an interest and will serve as vice-president. Plans for the enlargements are being formed.

Detroit

DETROIT, May 2.

FIRE, April 22, destroyed a portion of the recently completed plant of the Briggs Mfg. Co., 11631 Mack Street, Detroit, comprising for the most part a five-story structure, given over to automobile body building and assembling, with loss reported upward of \$1,000,000 including equipment. Plans for rebuilding are under consideration.

The Parker Rust Proof Co., 2177 East Milwaukee Street, Detroit, operating a processing plant for rust-proofing, is reported to be planning a one-story addition to its plant at Marencl, Mich., to cost close to \$45,000 including equipment.

The Detroit Stove Works, Inc., 6900 East Jefferson Street, Detroit, has plans under way for an addition to be used largely for steel enameling. Charles Kotting, Dime Bank Building, is architect.

The Ford Motor Co., Detroit, is said to be planning the early construction of a hydroelectric generating station on the Huron River, near Ypsilanti, Mich., to cost upward of \$500,000.

The Board of Education, Birmingham, Mich., is considering the installation of manual training equipment in its proposed new junior high and grade school at Bloomfield Hills, to cost \$165,000, for which it is expected to ask bids late in the spring. Stahl & Co., McKerchey Building, Detroit, are architects.

Fire, April 13, destroyed a portion of the machine works of Coolsaet Brothers, Fordson, Mich., with loss reported at close to \$25,000 including machinery.

The Port Huron Corporation, Port Huron, Mich., recent purchaser of the local plant and business of the Port Huron Thresher Co., is completing arrangements to use the property for the manufacture of a new type of automobile of hydraulic drive construction, without gear transmission, brakes or clutch. A portion of the plant will be given over to the production of the hydraulic drive equipment and the other part to assembling. Arrangements will be made for parts manufacture at outside plants. It is purposed to begin production by the close of the year.

The Port Huron Sulphite & Paper Co., Richardson Avenue, Port Huron, Mich., has plans for the erection of a one-story addition, to cost approximately \$50,000 with equipment. Raseman & Freler, Murphy Building, Detroit, are architects. J. P. Durand is secretary.

The General Brass Corporation, Detroit, has been organized to take over and consolidate the McRae & Roberts Co., 100 South Campbell Street; the Michigan Lubricator Co., 3643 Beaubien Street, and the Standard-Peninsula Brass Works, 6656 Walton Street. All of the present plants will be continued in operation and plans are maturing for expansion.

The Kelsey Wheel Co., Detroit, and the Hayes Wheel Co., Jackson, Mich., are to be merged and the new company will be known as the Kelsey-Hayes Wheel Corporation. Announcement of the merger has been made by C. B. Hayes, president Hayes Wheel Co. All common stock of the Hayes company is to be bought by the new organization and holders are to receive \$15 per share plus a half share of stock in the Kelsey-Hayes Corporation for each share of common stock of the Hayes company. The Hayes Wheel Co. was organized in 1908 and besides two plants at Jackson has property at Albion and Flint, Mich., and at Anderson, Ind.

Pacific Coast

SAN FRANCISCO, April 27.

WORK will soon begin on the proposed addition to the plant of the General Electric Co., 5441 East Fourteenth Street, Oakland, Cal., to cost close to \$150,000 with equipment, for which a general contract recently was let to the Foundation Co., Kohl Building, San Francisco.

The Novelty Chair Co., Glendora, Cal., has awarded contract to August Friedrich, Glendora, for a new one-story plant, 100 x 200 ft., to cost about \$35,000 with equipment.

The City Council, Pasadena, Cal., is asking bids until May 17 for one steam surface condenser with auxiliary equipment for the municipal electric power plant.

Angelo & Son, Bay and Mason Streets, San Francisco, manufacturers of veneer boxes, fruit containers, etc., are considering plans for rebuilding the portion of their plant recently destroyed by fire, with loss in excess of \$75,000 including equipment.

The Milmeroth Service & Cold Storage Co., Wenatchee, Wash., contemplates the construction of a new one-story cold storage and refrigerating plant, to cost more than \$40,000 with equipment.

The California Eastern Oil Co., Los Angeles, recently consolidated with the Julian Petroleum Corporation, same city, has plans for the construction of a new gasoline refinery in the Alamitos Heights oilfields with initial capacity of 12,000 gal. per day, to cost more than \$125,000 with equipment.

The Western Can Co., 180 Townsend Street, San Francisco, has filed plans for the erection of its two-story and basement plant, to cost more than \$75,000 with equipment, for which a general contract recently was let to MacDonald & Kahn, Financial Center Building. Leland Rosener, 60 Sansome Street, is engineer.

The Hawthorne Furniture Mfg. Co., Los Angeles, will proceed with the construction of a new one-story plant, 245 x 300 ft., for which a general contract recently was let to the Industrial Building Co., Pacific National Bank Building. The majority of equipment will be electrically operated. The factory will cost \$125,000 with machinery. A. Godfrey Bailey, Hillstreet Building, is architect.

The Scheu National Orchard Heater Co., Covina, Cal., manufacturer of heating apparatus for frost protection for fruit orchards, has filed plans for a one-story and basement building, 70 x 150 ft.

The Board of Education, Jordan School District, Sandy, Utah, contemplates the installation of manual training equipment in its proposed junior high schools at Sandy and Midvale, to cost about \$125,000 each. Scott & Welsh, Dooly Building, Salt Lake City, are architects.

Pacific Coast agencies of the Reed-Prentice Corporation, Worcester, Mass., have been arranged with the Shaw-Palmer-Bakewell Co., Los Angeles, for machine tool equipment and portable link sawing machines; with the Flanagan Machinery Co., San Francisco, and F. A. Daley Co., Portland, for machine tool equipment, and with A. L. Young Machinery Co., San Francisco, and P. Sinnock & Co., Portland, for the portable link sawing machine.

Canada

TORONTO, May 2.

MACHINE tool sales in this market took a decided upward turn during the past ten days, chiefly due to the placing of some large orders by mining companies in Quebec and northern Ontario. It is reported that one company in the Rouyn district placed an order for approximately \$100,000 worth of machine tools, while several smaller orders were also closed. Inquiries from industrial plants are improving and some lists for from six to 12 items have recently appeared. The automotive industry is supplying a good demand and dealers are looking for a list from the General Motors Corporation in connection with a proposed \$500,000 addition at Oshawa.

Industrial companies, as a whole, are operating on a better basis than a year ago, and while considerable sums have already been spent to bring equipment up to date, it is expected that even greater buying will be done in the near future. Steel mills at Hamilton, Ont., and Sydney, N. S., have programs of plant improvement which will involve the purchase of considerable equipment.

Creber Brothers, Kingston Road, Toronto, are planning a monument works at Acton, Ont., to cost \$30,000. An electric crane with a 15-ton lifting capacity will be installed.

Fittings, Ltd., Bruce Street, Oshawa, Ont., manufacturer of pipe fittings, chain belting, etc., is planning to rebuild a core room destroyed by fire April 11.

McGregor & McIntyre, Ltd., 1139 Shaw Street, Toronto, will start work at once on a \$10,000 addition to its structural steel shops.

Following a recent visit of Frank P. Jones, president of the Canada Cement Co., Montreal, to the gypsum areas in Antigonish County, N. S., it was stated that the company will immediately proceed with development work there to cost \$500,000. A crushing plant will be installed, and a power plant erected to use oil as fuel.

Bids are being received by S. A. Magrath, chairman Hydroelectric Power Commission of Ontario, University Avenue, Toronto, until June 1, for the erection of galvanized steel towers for a 220,000-volt, single circuit, transmission line, from the Ottawa River crossing at a point near Fitzroy Harbor to the outskirts of Toronto, a distance of approximately 400 miles. Plans and specifications are with F. A. Gaby, chief engineer, 190 University Avenue, Toronto.

The general contract for the construction of a factory for Link-Belt, Ltd., Toronto, Ont., has been awarded to Jackson-Lewis Co., Ltd., and the steel contract to

McGregor & McIntyre, Ltd., Toronto. The building will cost \$100,000. Mechanical trades have not been let. Ewart, Armer & Byam, Ltd., Excelsior Life Building, Toronto, are engineers.

R. W. Leonard, president Conlagas Mines, Ltd., Porcupine, Ont., states that his company will build a 500-ton mill on the property of the Conlaurum Mines, Ltd.

The Ottawa Electric Co., Ottawa, Ont., has started work on a new building to cost \$750,000.

P. S. Shillington, clerk, Blenheim, Ont., will receive bids until May 9 for equipment for a new pumping station, construction of a concrete reservoir and pumping station, supply and erection of a 50,000-gal. capacity steel elevated tank, etc. Wynne-Roberts, Son & McLean, Toronto, are consulting engineers.

The Hamilton Street Railway Co., Hamilton, Ont., has started work on the erection of car barns to cost \$300,000. Architects are the Engineers Department, and Bernard H. Prack, 608 Lister Building.

The Canadian Spool & Bobbin Co., Ltd., Durham Street, Walkerton, Ont., will start work immediately on remodeling and extending its plant. New machinery will be installed

Western Canada

Tenders will be received by the chief engineer, Western Division, Canadian National Railways, Winnipeg, Man., until May 10, for the construction of a power house, etc., at Edmonton, Alta.

The Beaver Oil & Refining Co., will start work immediately by day labor on the erection of a cracking plant at Coutts, Alta., to cost \$100,000.

Plans are being prepared by the International Harvester Co. of Canada, Ltd., head office at Chicago, for a distribution plant at Weyburn, Sask., to cost \$250,000.

Metals, Ltd., 104th and 102nd Streets, Edmonton, Alta., has taken out a permit for an addition to its plant.

The British Veneer Works, Nelson, B. C., will establish a plant on the foreshore near Water Street, and has placed an order for \$25,000 worth of machinery to be delivered next August.

Foreign

THE General Motors Corporation, General Motors Building, Detroit, has secured a lease of property from the city of Stockholm, Sweden, for 49 years as a site for a proposed plant, on which work will begin soon. It will be used largely for assembling and will cost in excess of \$400,000 with equipment.

The Philadelphia Chamber of Commerce, Twelfth and Walnut Streets, has received an inquiry from a company at San Salvador desiring to get in touch with American manufacturers of machinery of various kinds interested in extending their trade in that section.

The Standard Oil Co. of New York, 26 Broadway, has closed an agreement with the Russian Soviet Government for the construction and operation of a new kerosene treating plant at Batoum, Russia, with rated output of more than 150,000 long tons per annum. The contract provides that the Standard company is to build the plant at once and turn it over to the Soviet Oil Syndicate (Naphthasyndicate U. S. S. R.), with stipulation that the Standard shall operate for a period of three years, with option for renewal for a like period.

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